

# Summary

October 7, 2024

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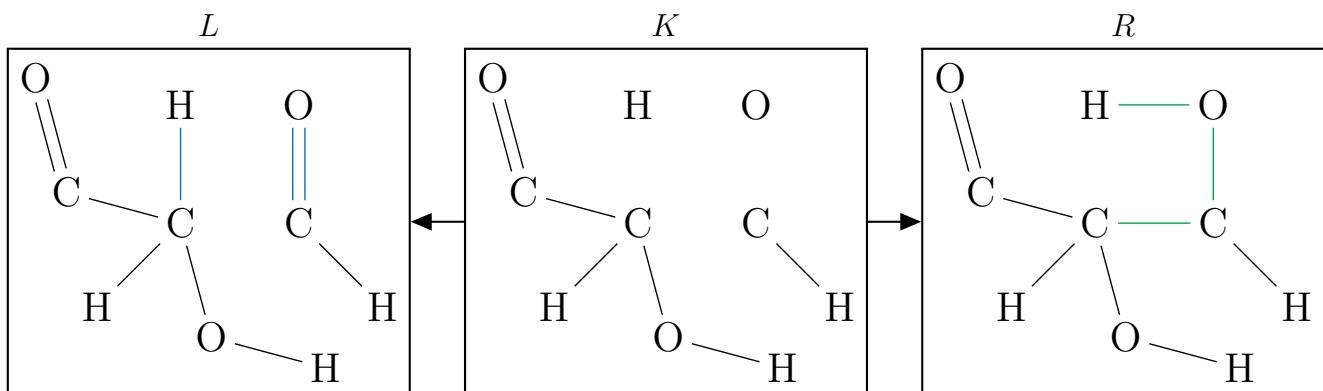
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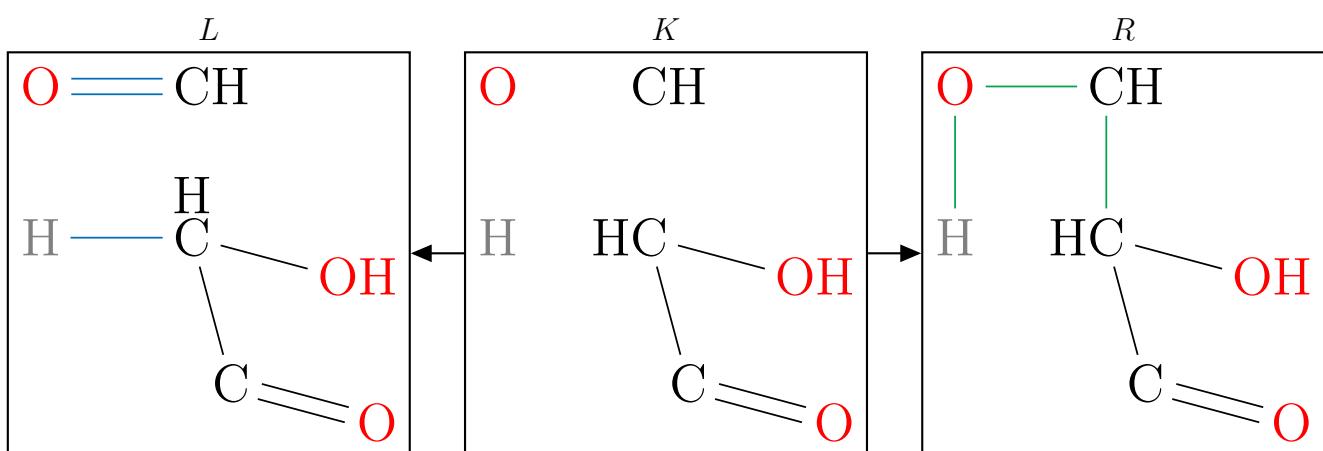
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## 0.1 Loaded Rules

0.1.1 AL

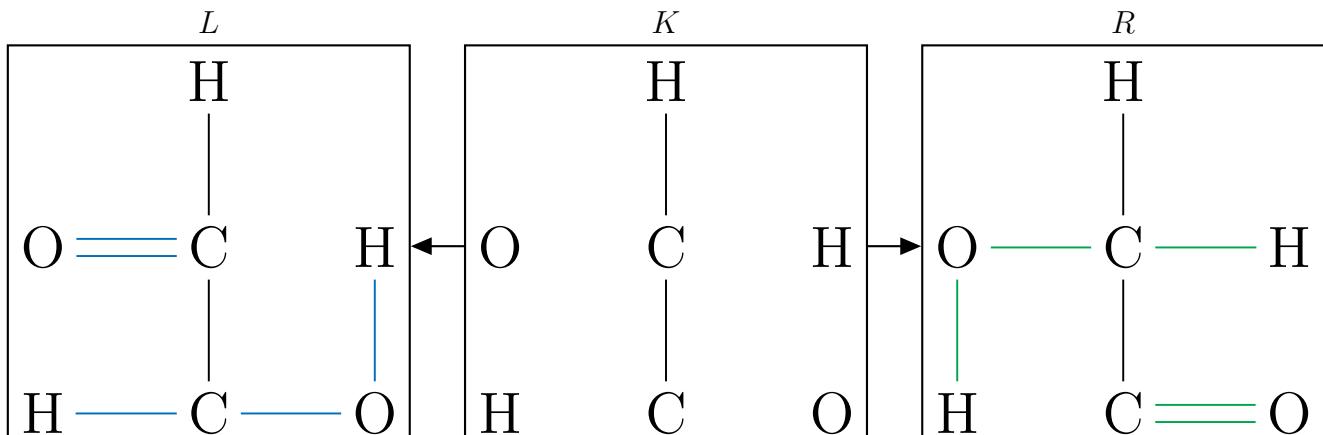


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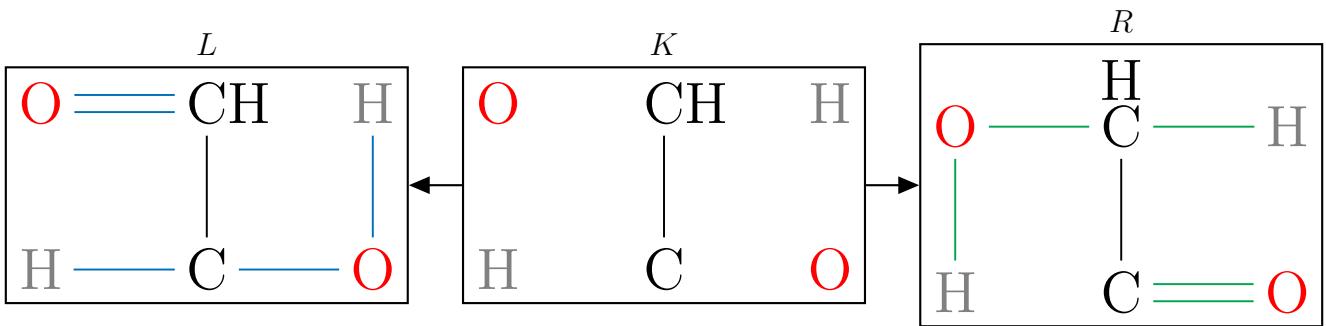


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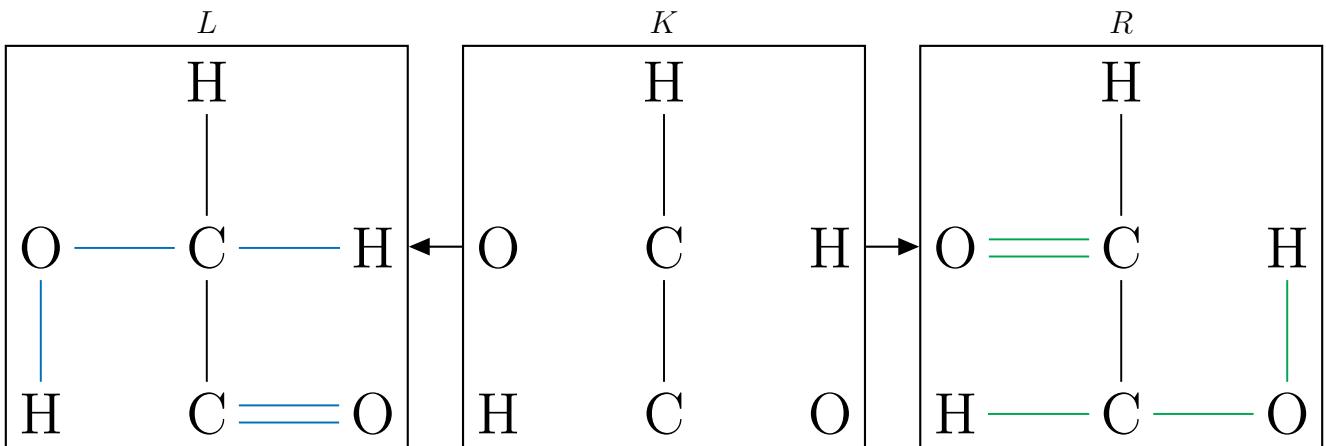
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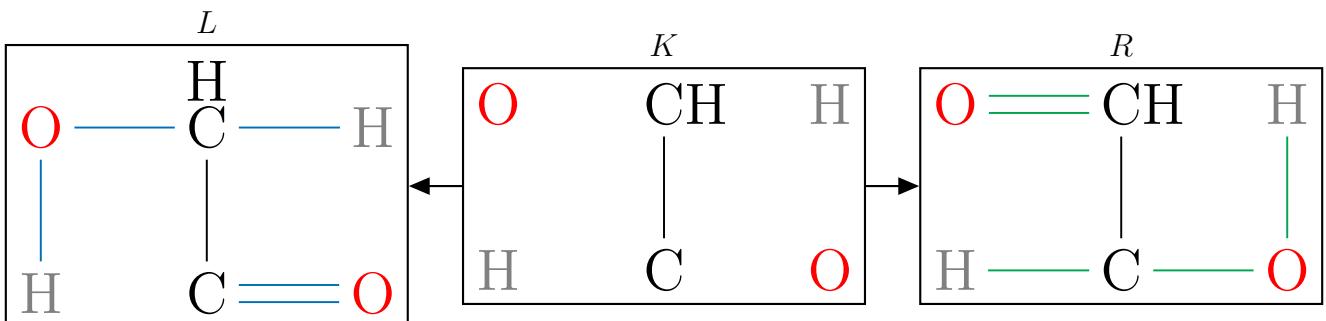
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### 0.1.3 KeAl



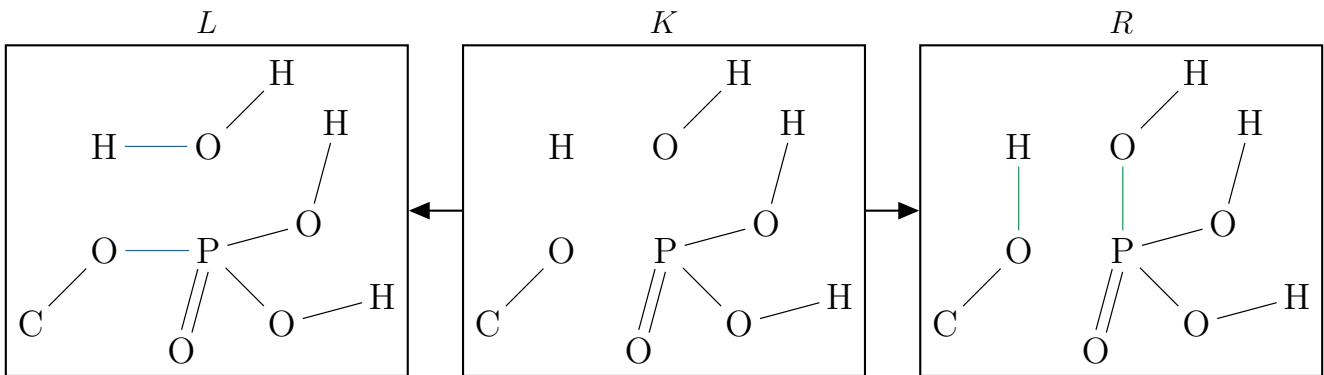
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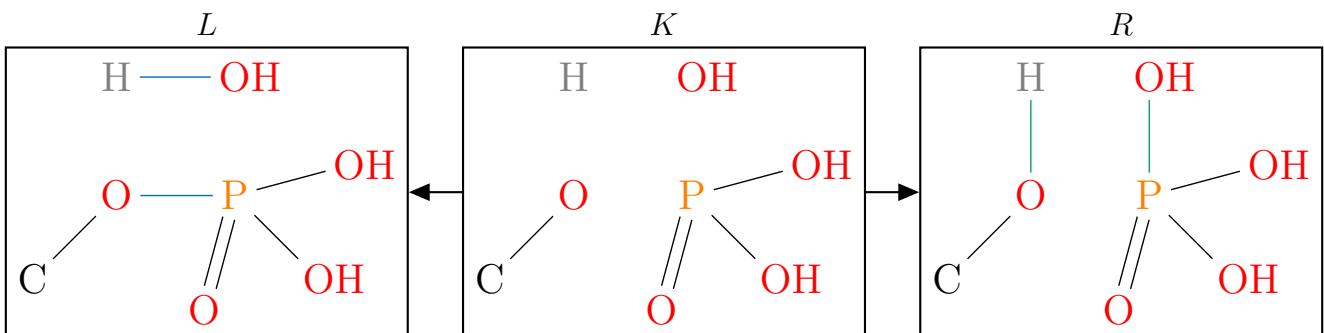
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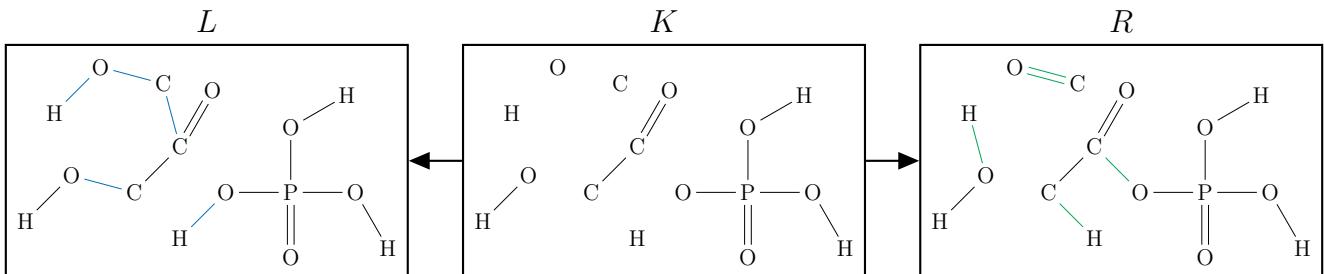


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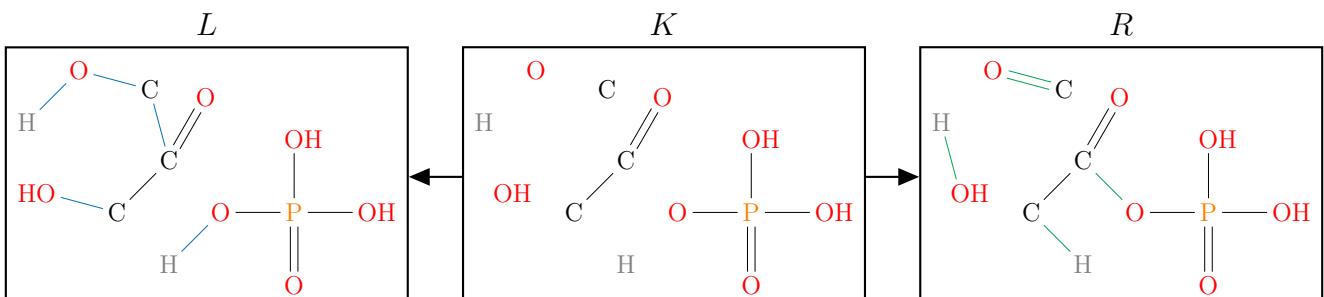


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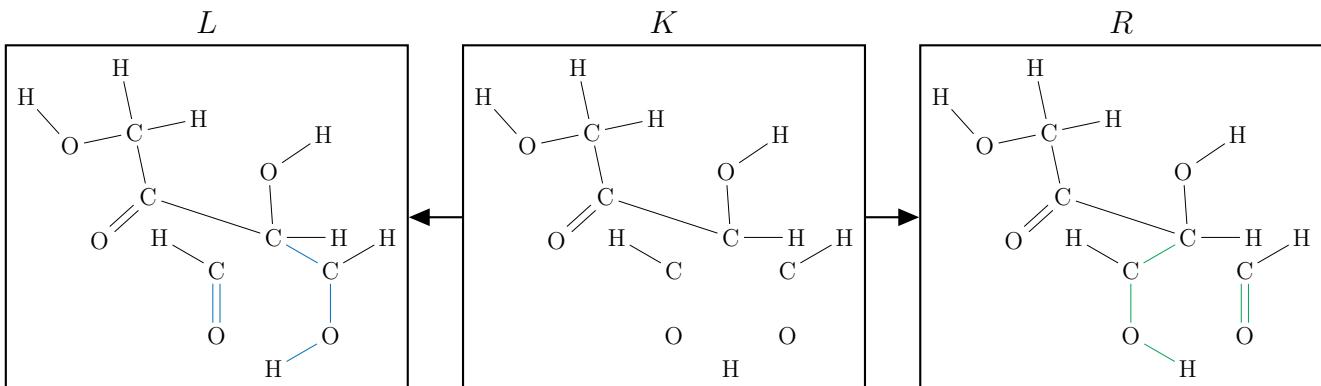


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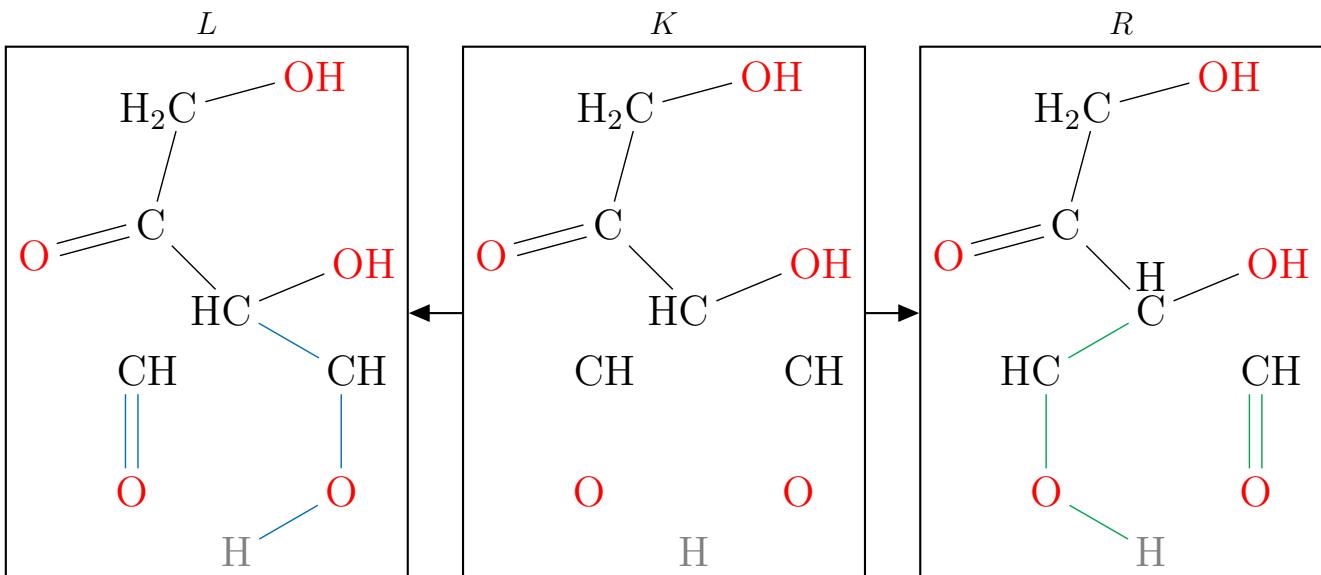


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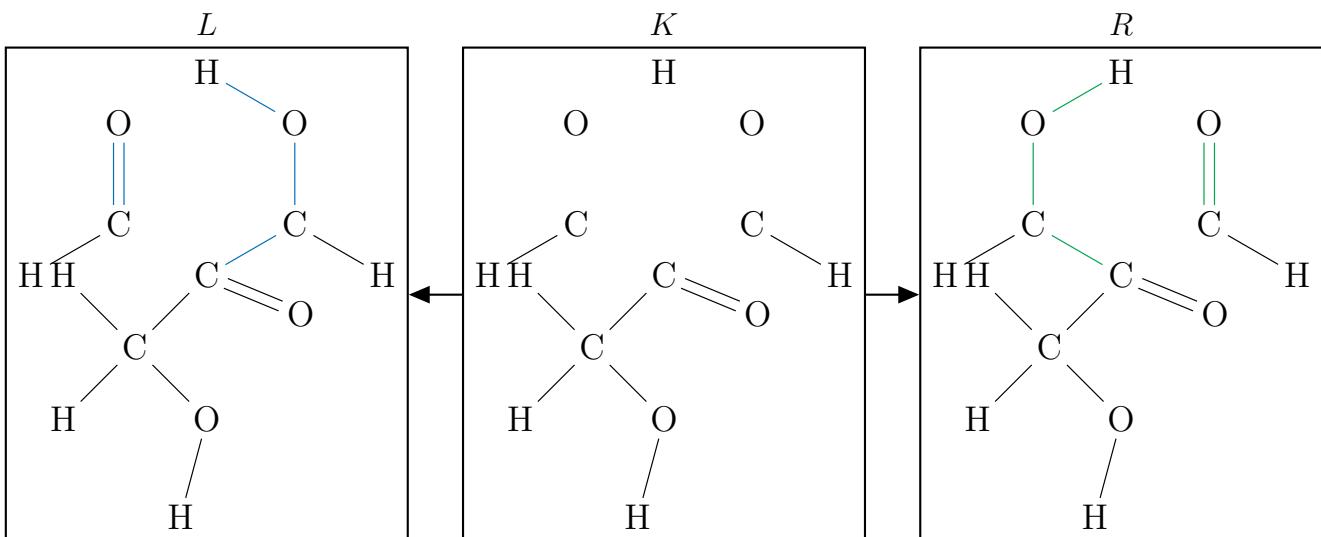


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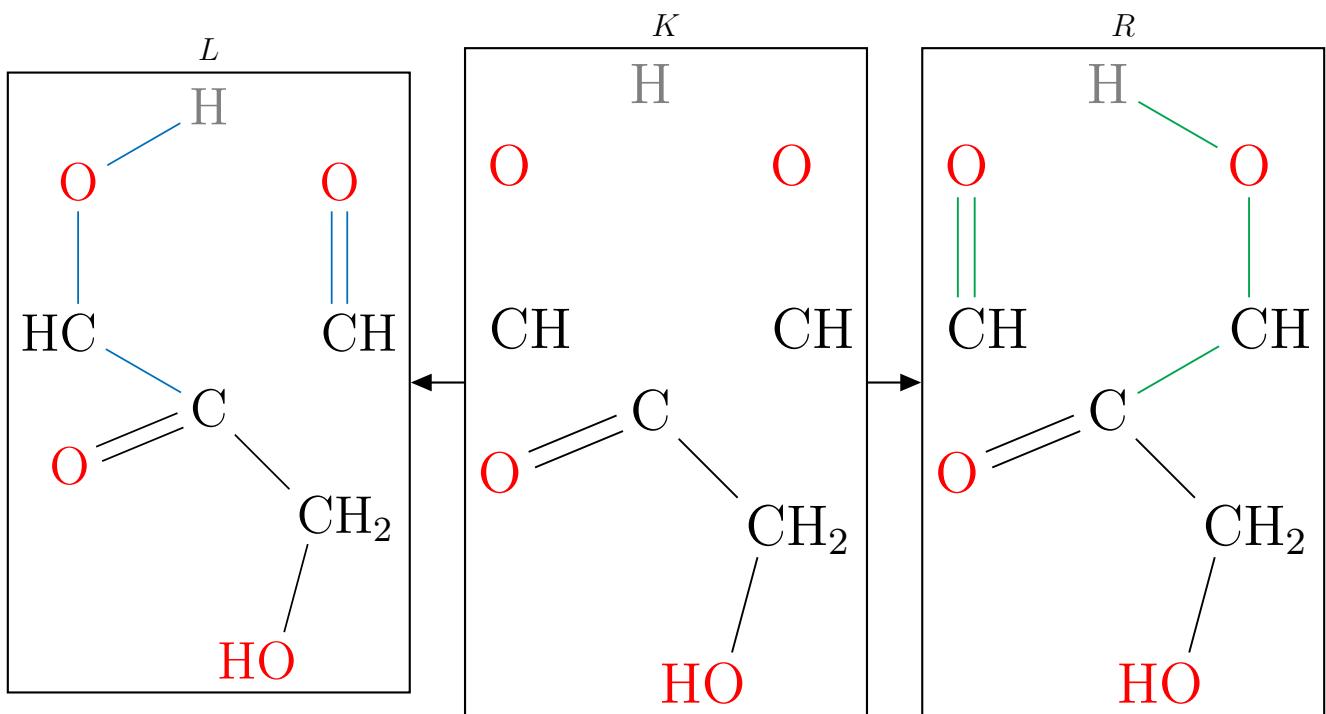


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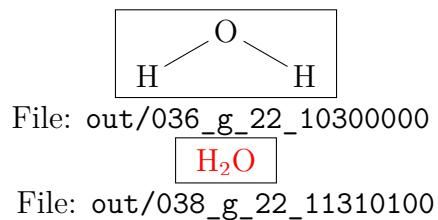


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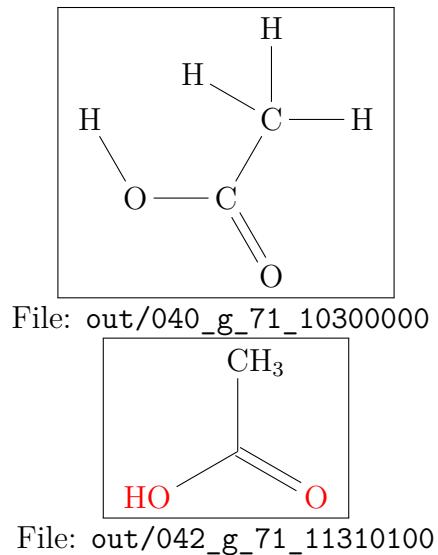
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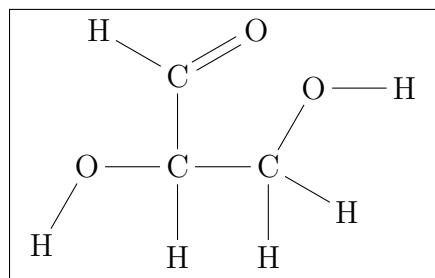
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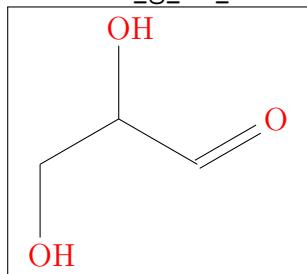
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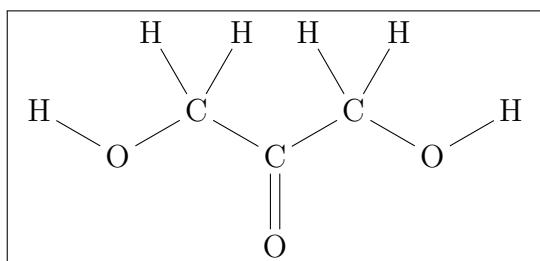


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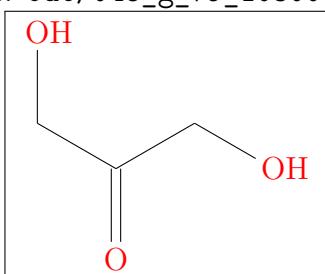


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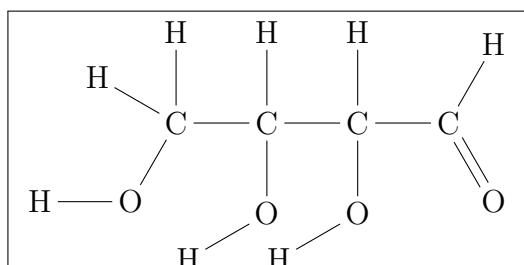


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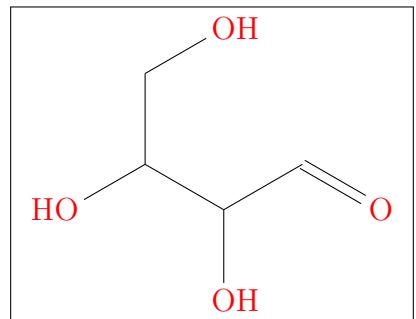


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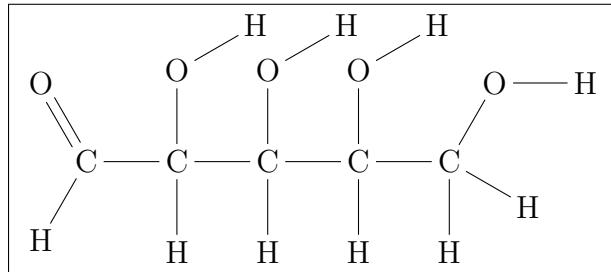


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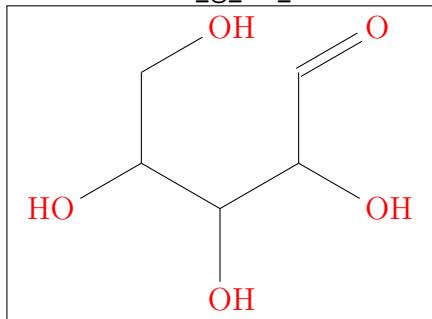


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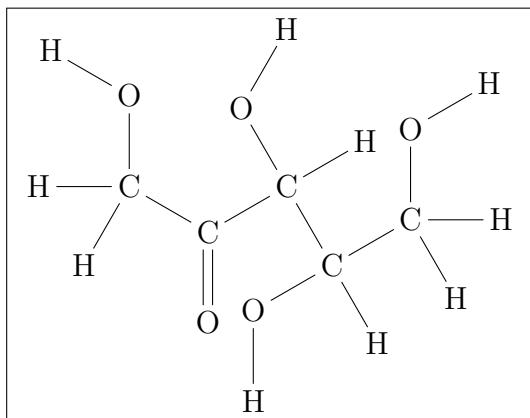


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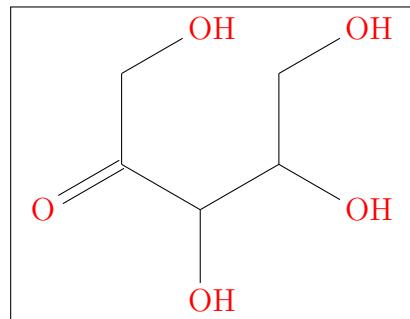


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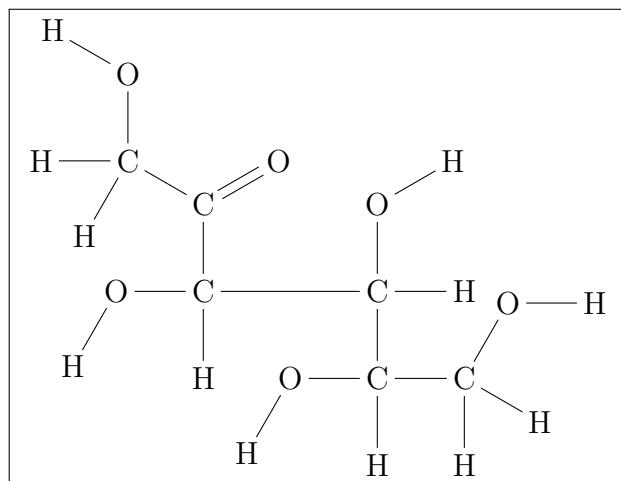


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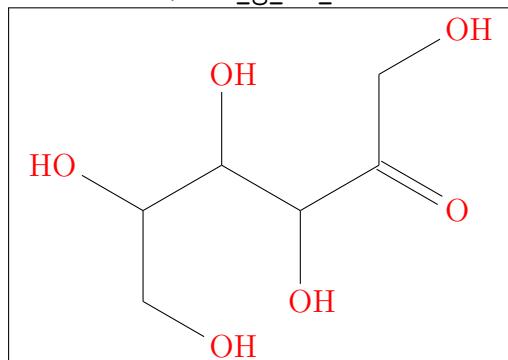


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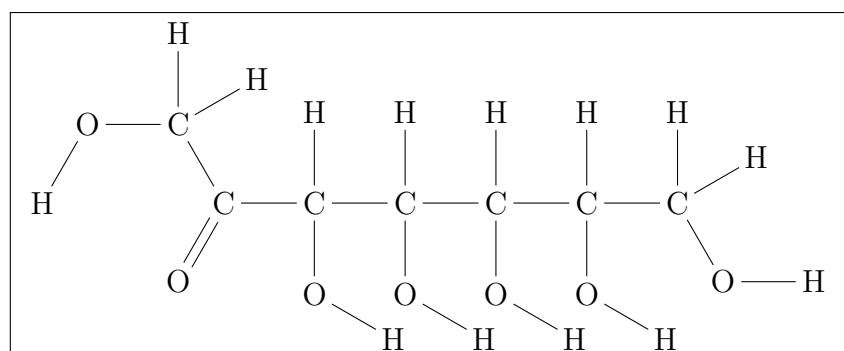


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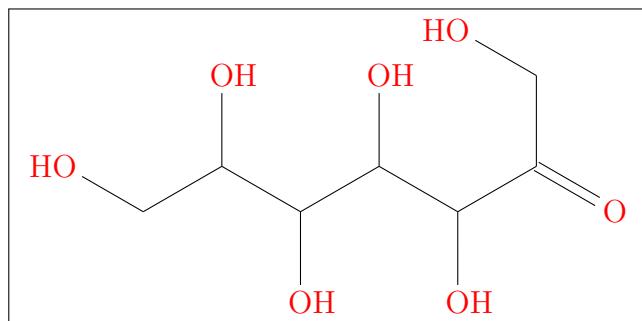


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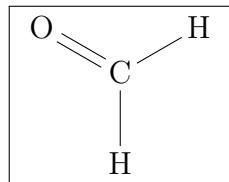


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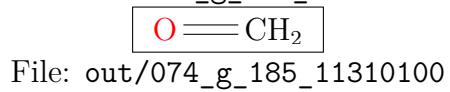


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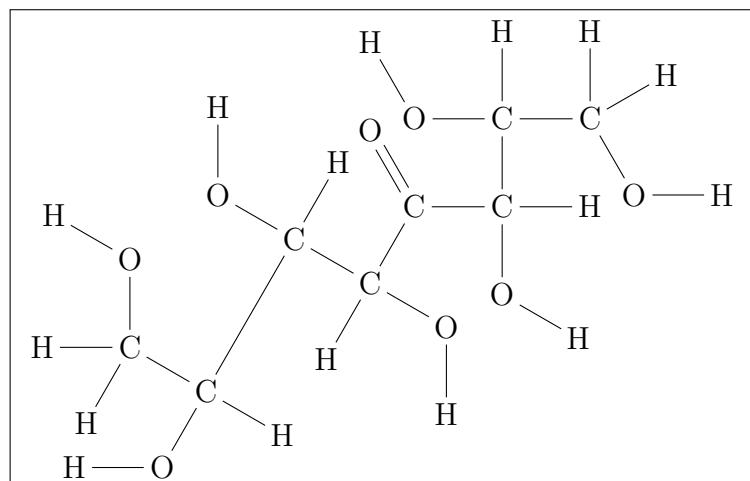


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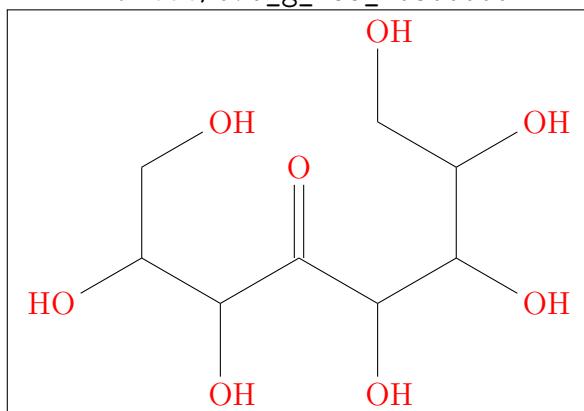


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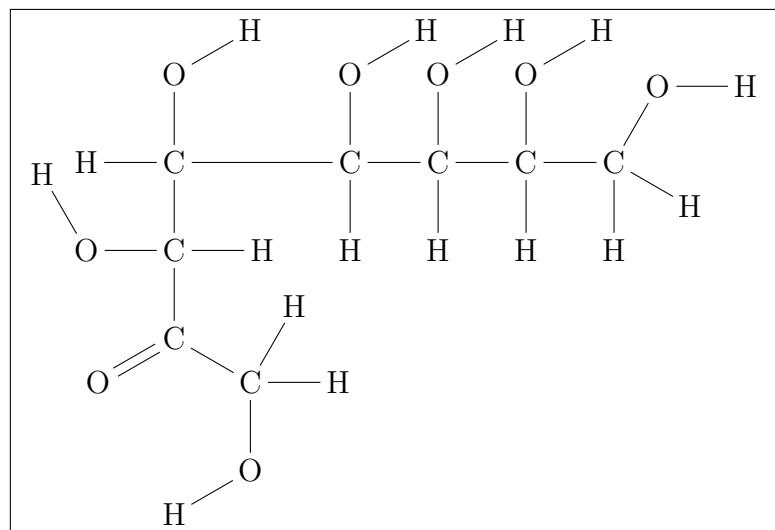


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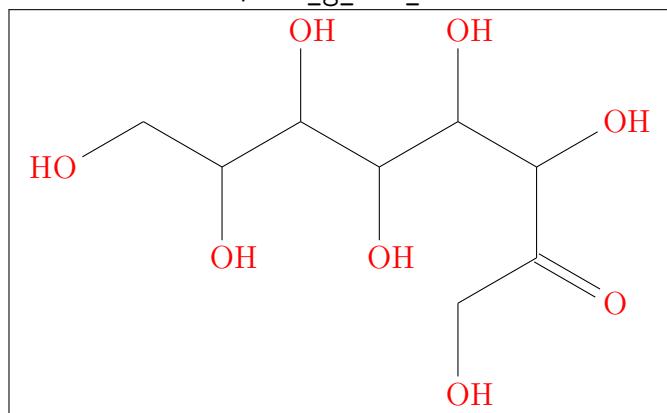


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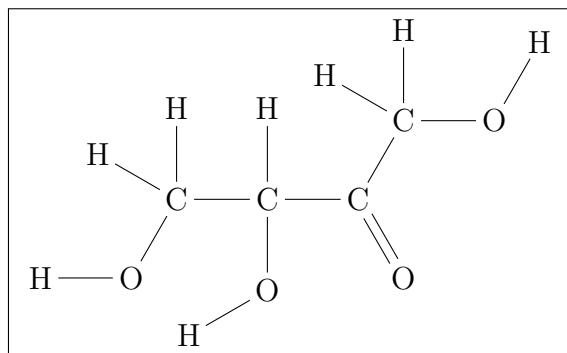


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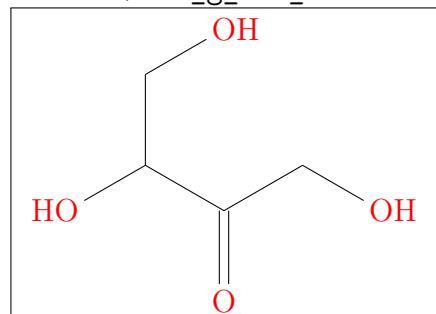


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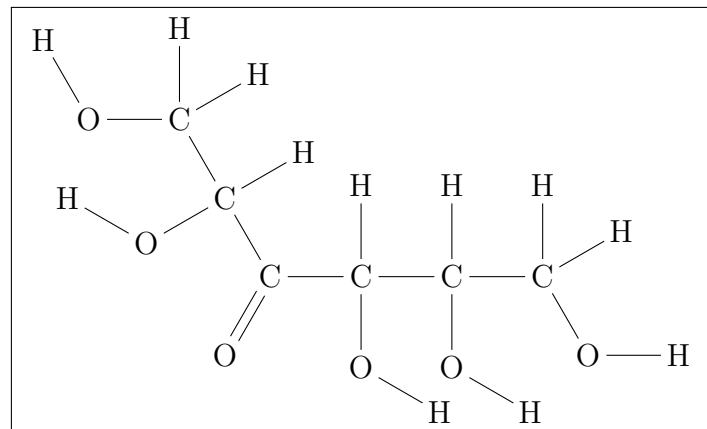


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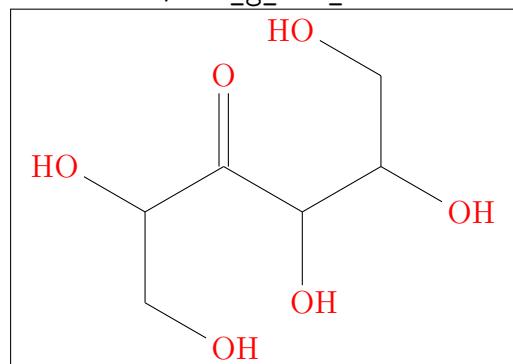


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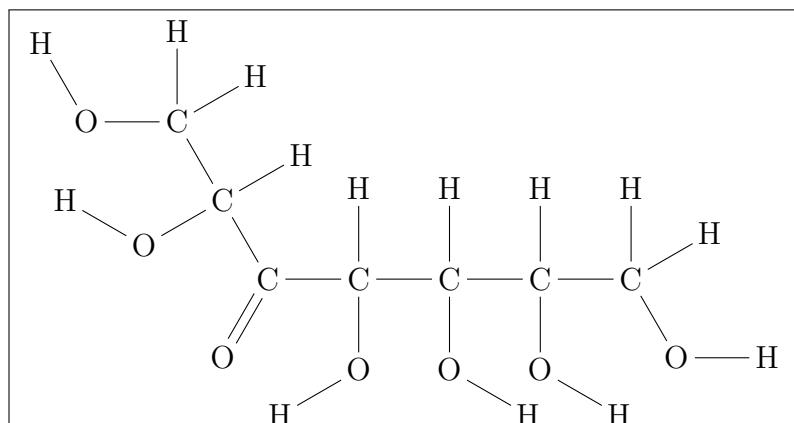


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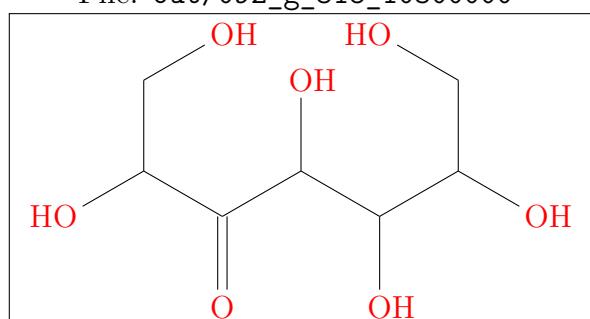


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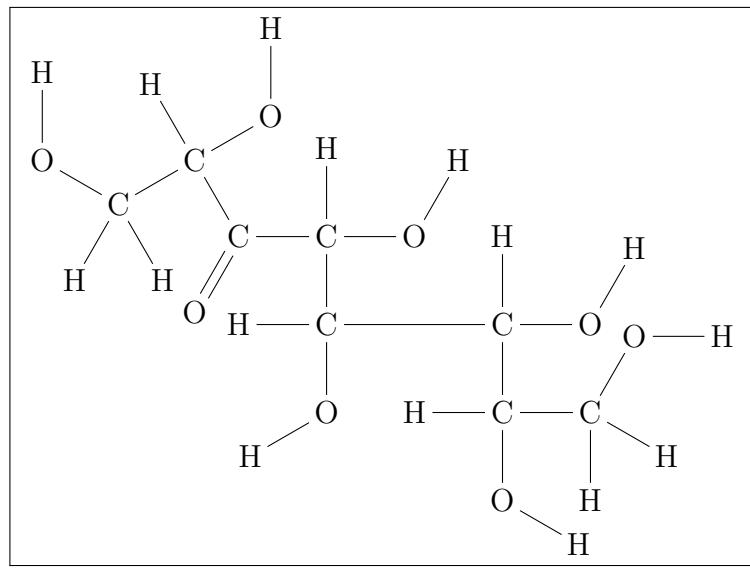


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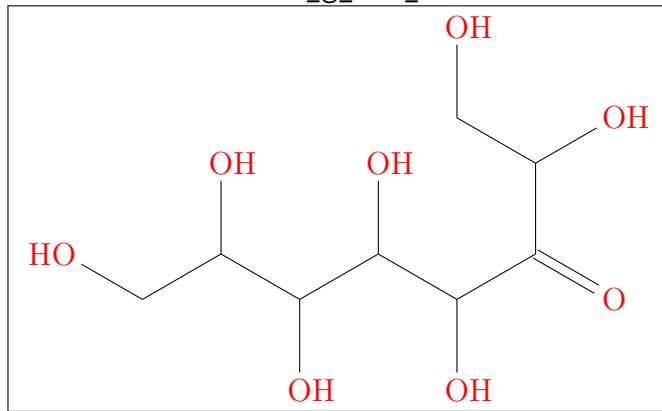


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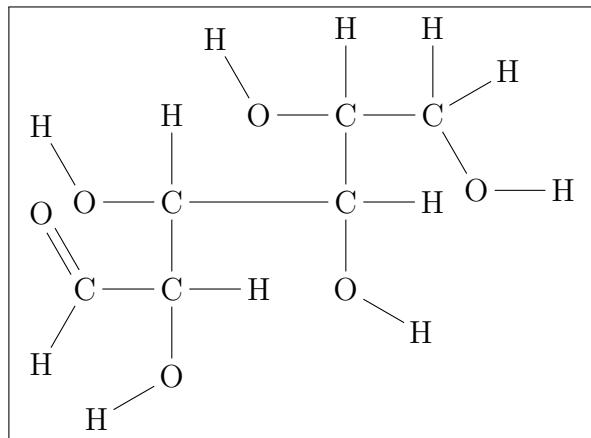


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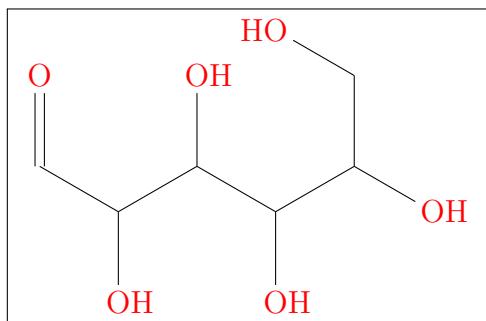


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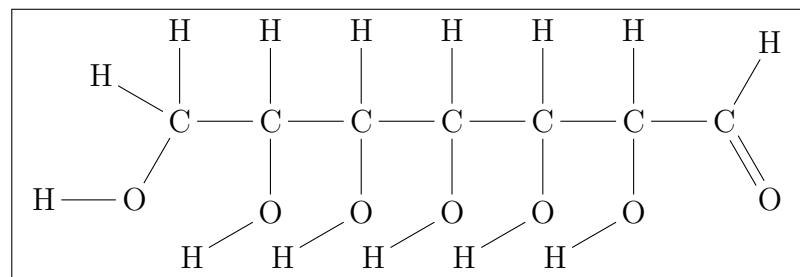


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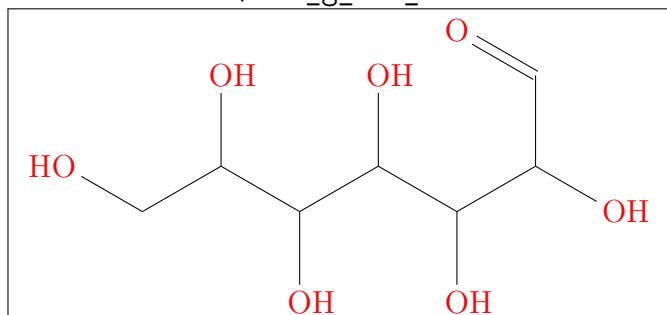


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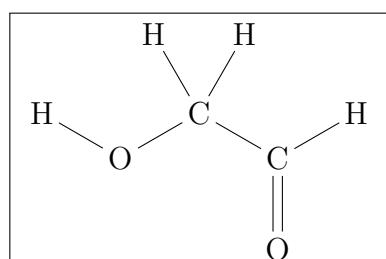


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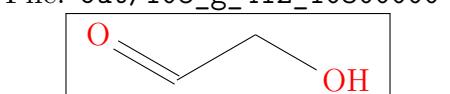


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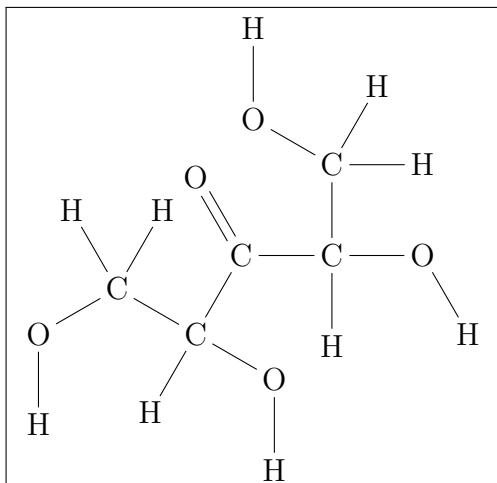


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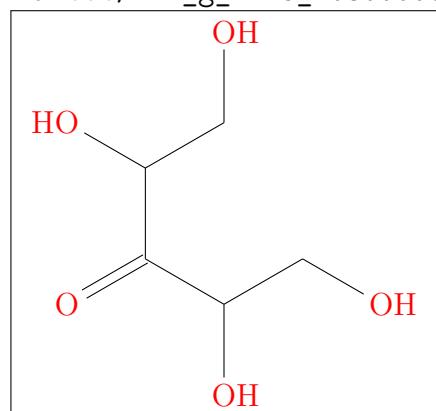


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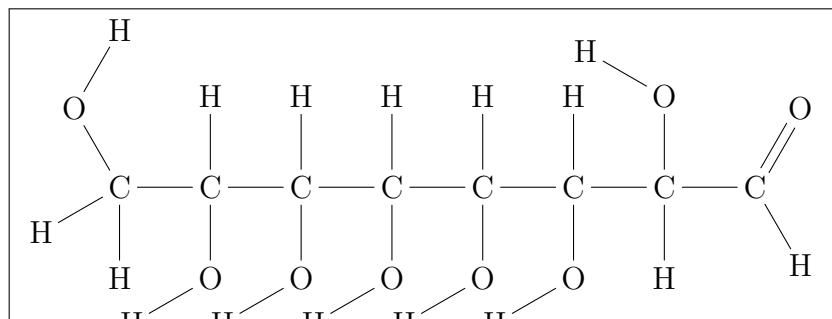


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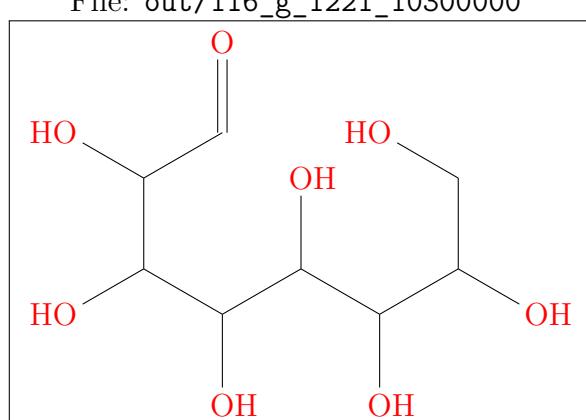


File: out/114\_g\_1218\_11310100

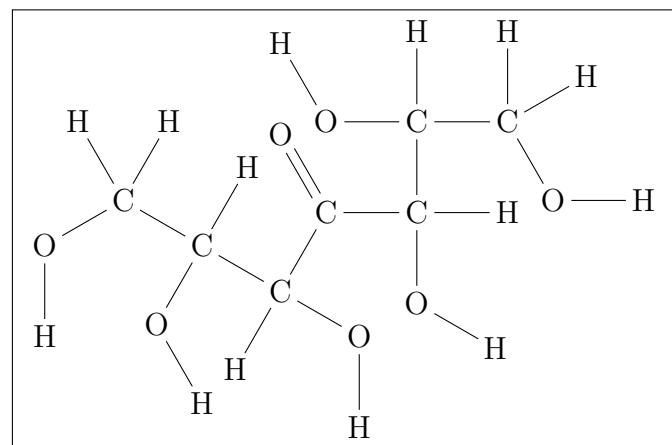
0.1.28 p\_{0,57}



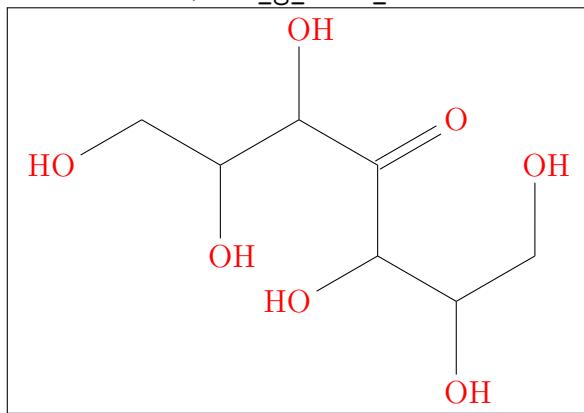
File: out/116\_g\_1221\_10300000



0.1.29 p\_{0,60}

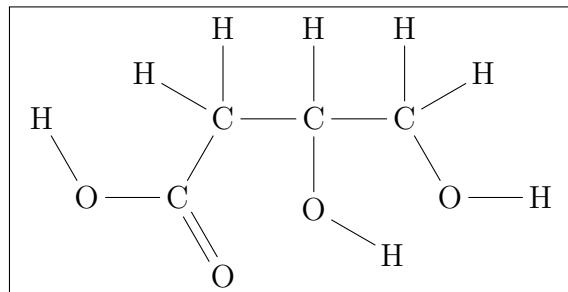


File: out/120\_g\_1309\_10300000

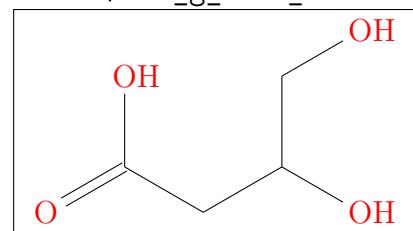


File: out/122\_g\_1309\_11310100

0.1.30 p\_{0,61}

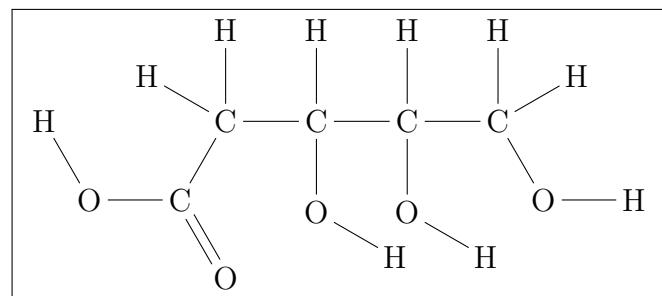


File: out/124\_g\_1429\_10300000

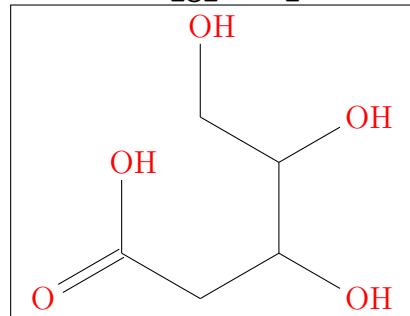


File: out/126\_g\_1429\_11310100

### 0.1.31 p\_{0,62}

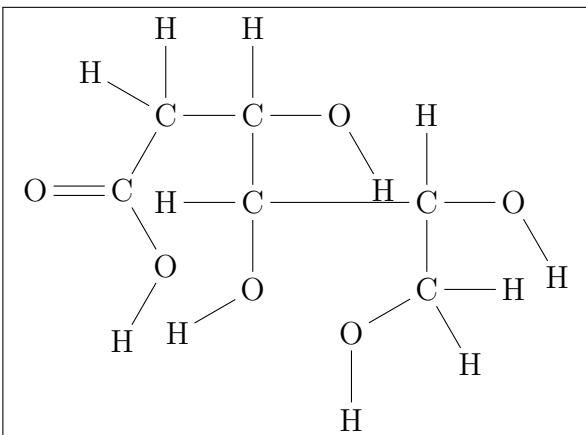


File: out/128\_g\_1437\_10300000

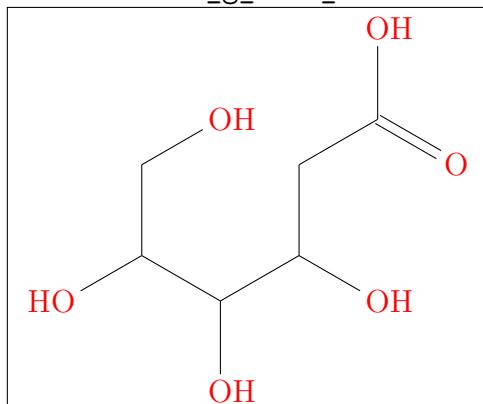


File: out/130\_g\_1437\_11310100

### 0.1.32 p\_{0,63}

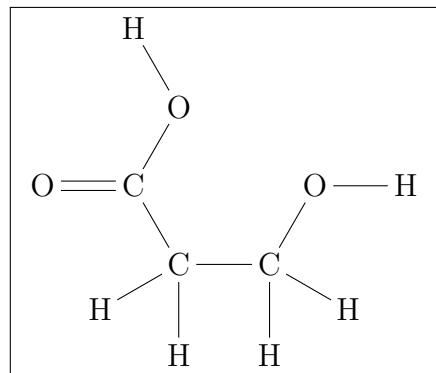


File: out/132\_g\_1445\_10300000

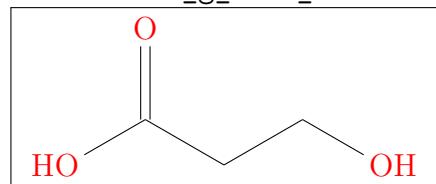


File: out/134\_g\_1445\_11310100

0.1.33 p\_{0,68}

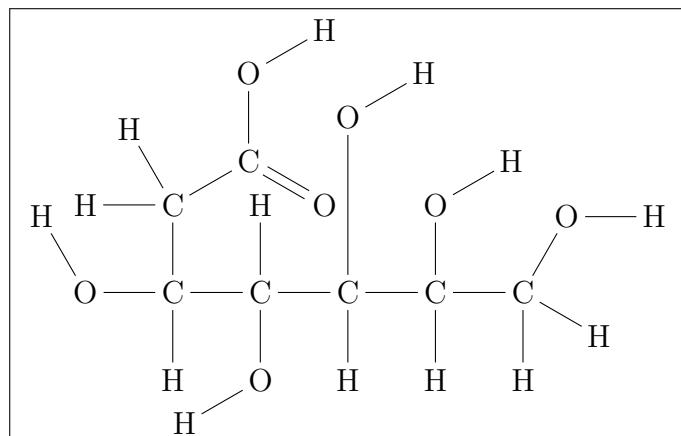


File: out/136\_g\_2596\_10300000

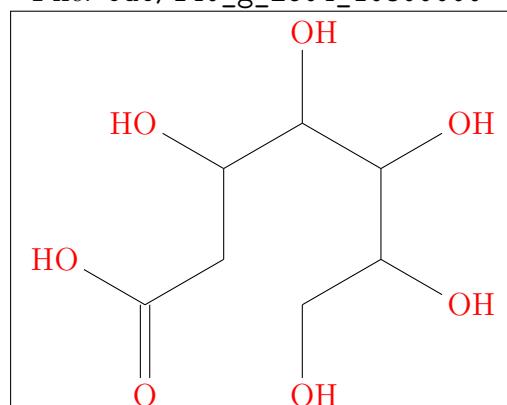


File: out/138\_g\_2596\_11310100

0.1.34 p\_{0,69}



File: out/140\_g\_2604\_10300000



File: out/142\_g\_2604\_11310100

## 0.2 Derivation Graph

### 0.2.1 DG Hyper, dg\_0

Figure too large, see out/143\_dg\_0\_11100\_coord.pdf

File: out/279\_dg\_0\_11100

$|V| = 81$   
 $|E| = 414$

## 0.3 Enumerated Flows with 7 reactions

## 0.4 Enumerated Flows with 7 unique reactions

### 0.4.1 Solution 0

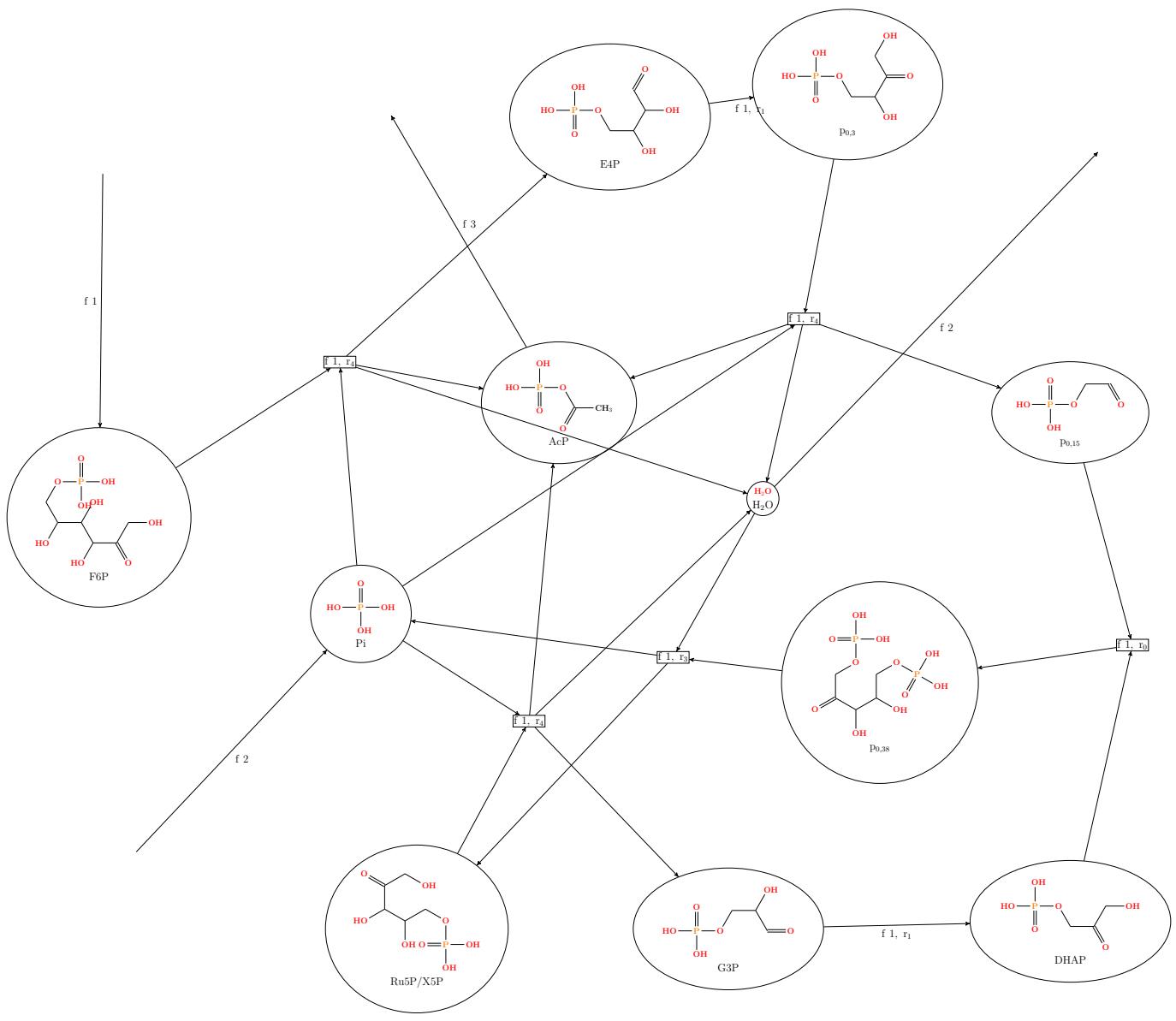
#### Overall Data

Objective value (integral): 7

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/284\_dg\_0\_11100\_f\_0\_0\_filt

$|E| = 7 \quad |P| = 7$

- 0.5 Enumerated Flows with 8 unique reactions
- 0.6 Enumerated Flows with 9 unique reactions
- 0.7 Enumerated Flows with 10 unique reactions
- 0.8 Enumerated Flows with 11 unique reactions
- 0.9 Enumerated Flows with 8 reactions
- 0.10 Enumerated Flows with 7 unique reactions

### 0.10.1 Solution 1

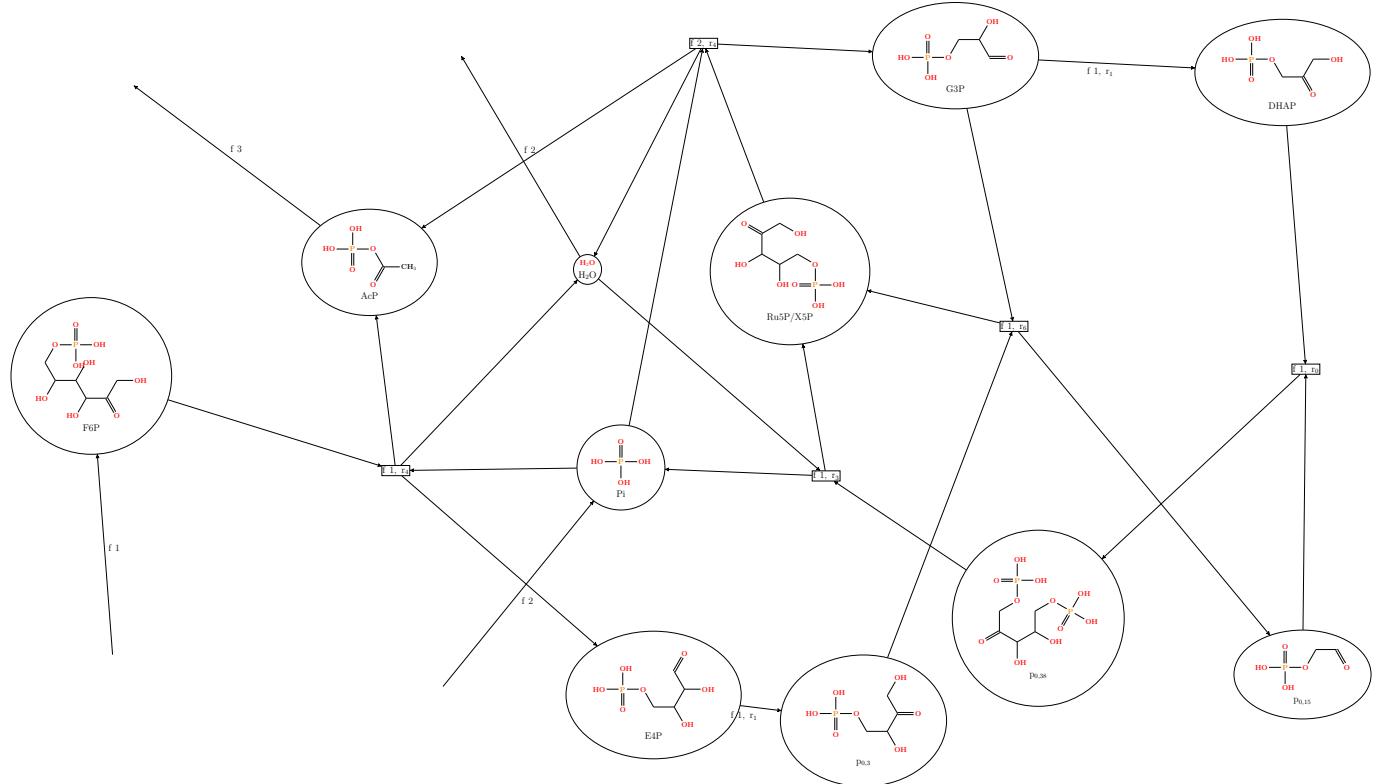
#### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

#### Filtered Graph



File: out/289\_dg\_0\_11100\_f\_0\_1\_filt

|E| = 7 |P| = 8

## 0.10.2 Solution 2

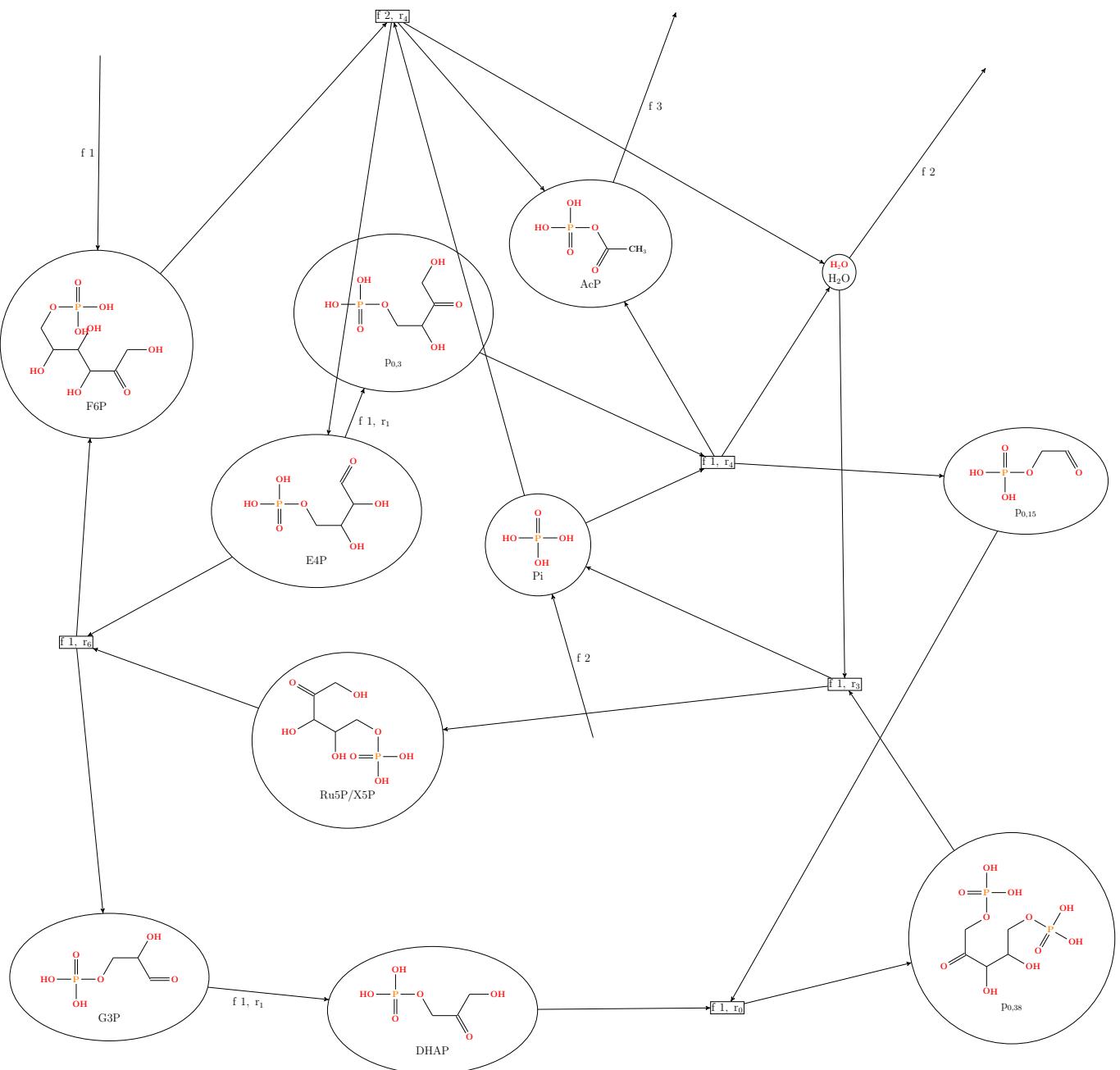
### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/294\_dg\_0\_11100\_f\_0\_2\_filt

|E| = 7 |P| = 8

### 0.10.3 Solution 3

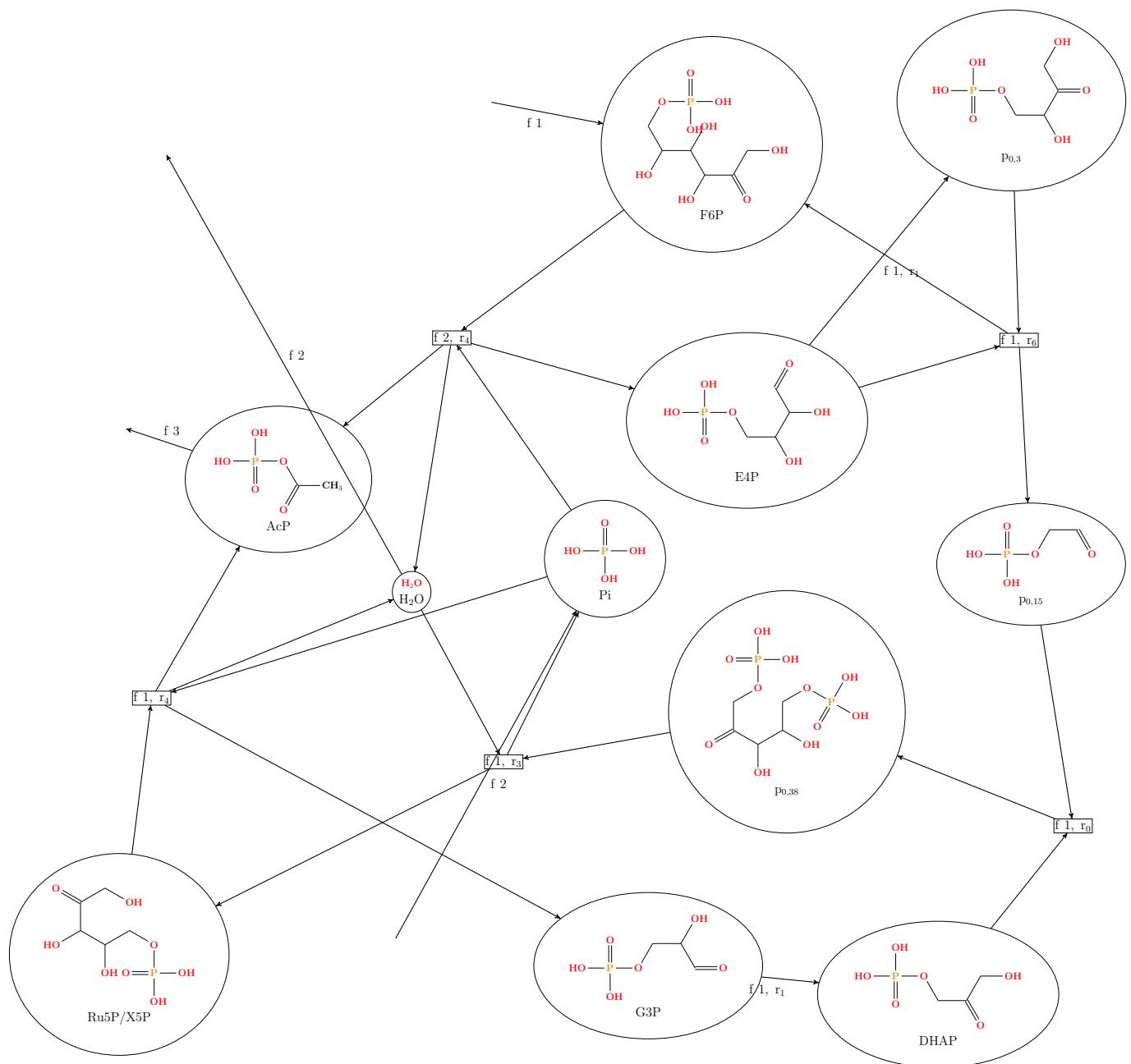
#### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

#### Filtered Graph



File: out/299\_dg\_0\_11100\_f\_0\_3\_filt

$$|E| = 7 \quad |P| = 8$$

## 0.10.4 Solution 6

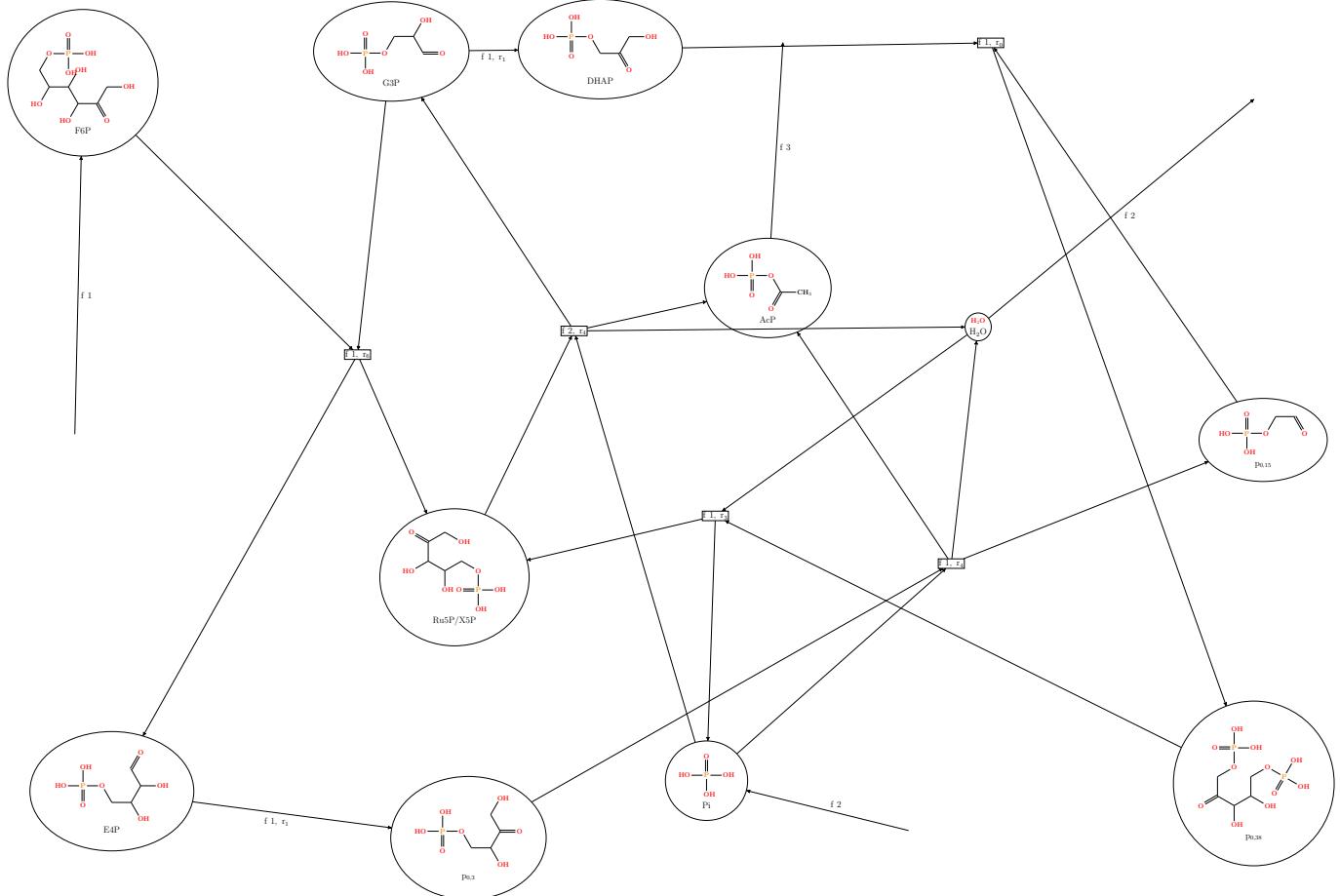
### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/304\_dg\_0\_11100\_f\_0\_6\_filt

|E| = 7 |P| = 8

## 0.10.5 Solution 7

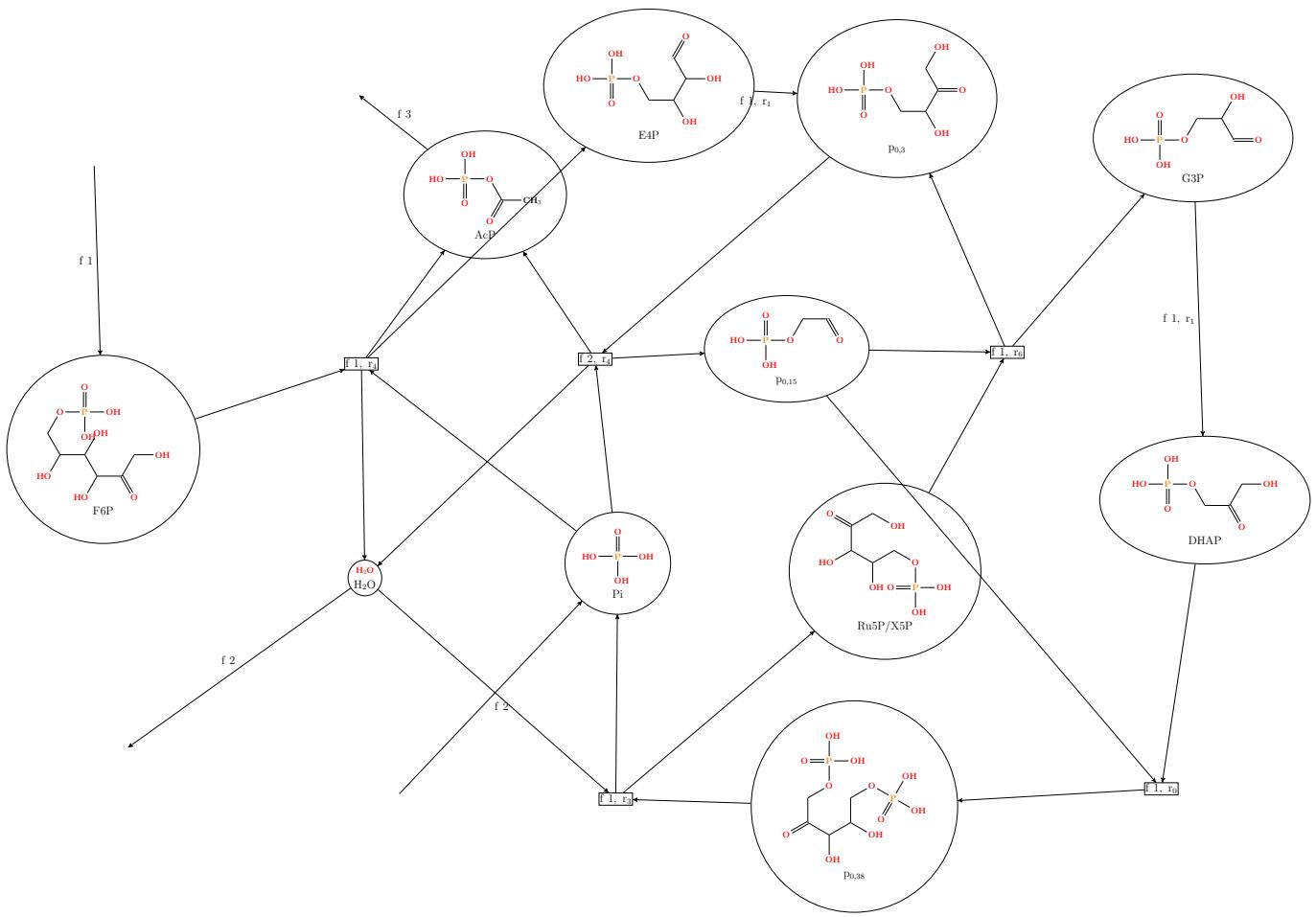
### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/309\_dg\_0\_11100\_f\_0\_7\_filt

$$|E| = 7 \quad |P| = 8$$

### 0.10.6 Solution 8

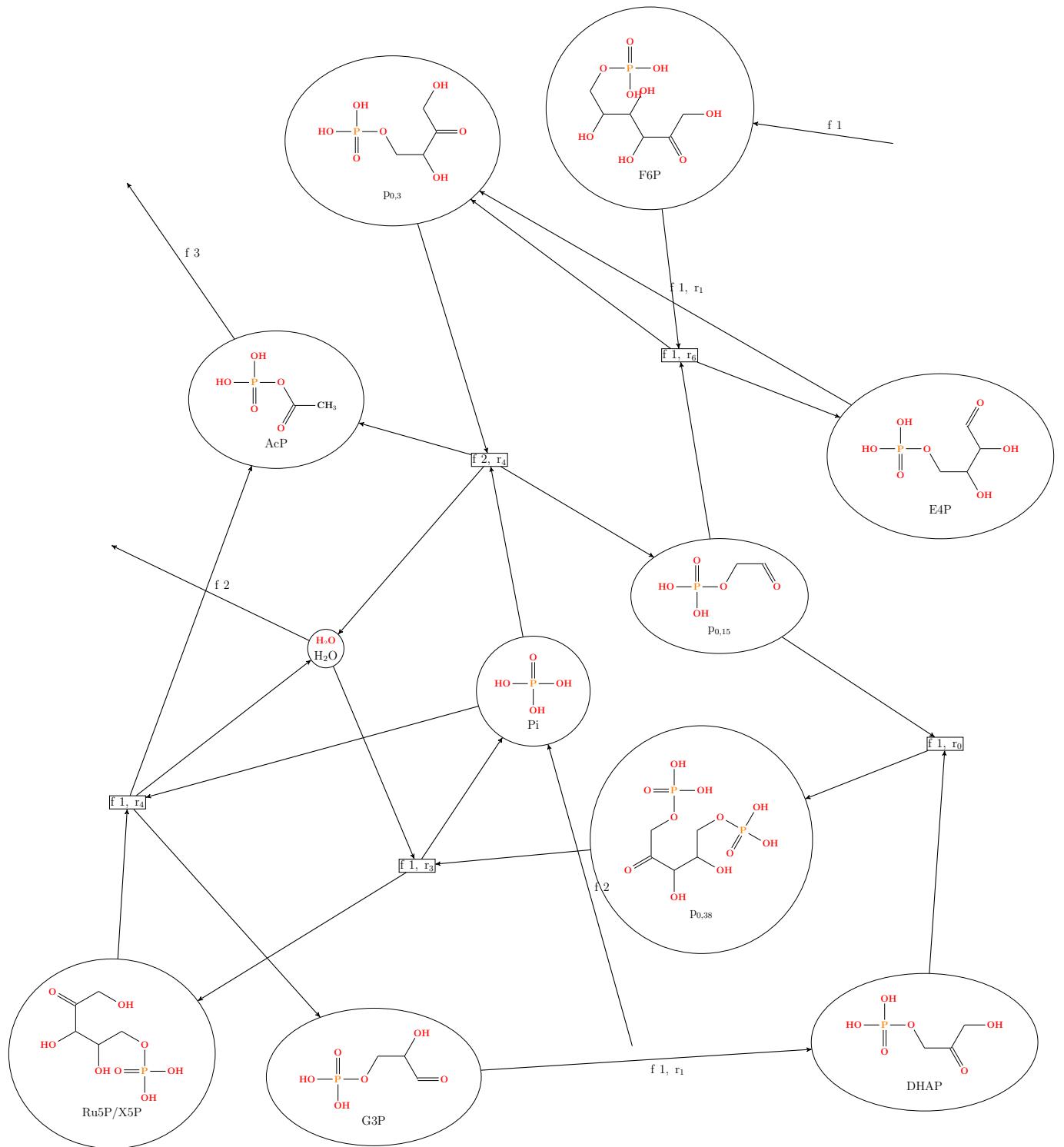
#### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/314\_dg\_0\_11100\_f\_0\_8\_filt

|E| = 7 |P| = 8

## 0.11 Enumerated Flows with 8 unique reactions

### 0.11.1 Solution 4

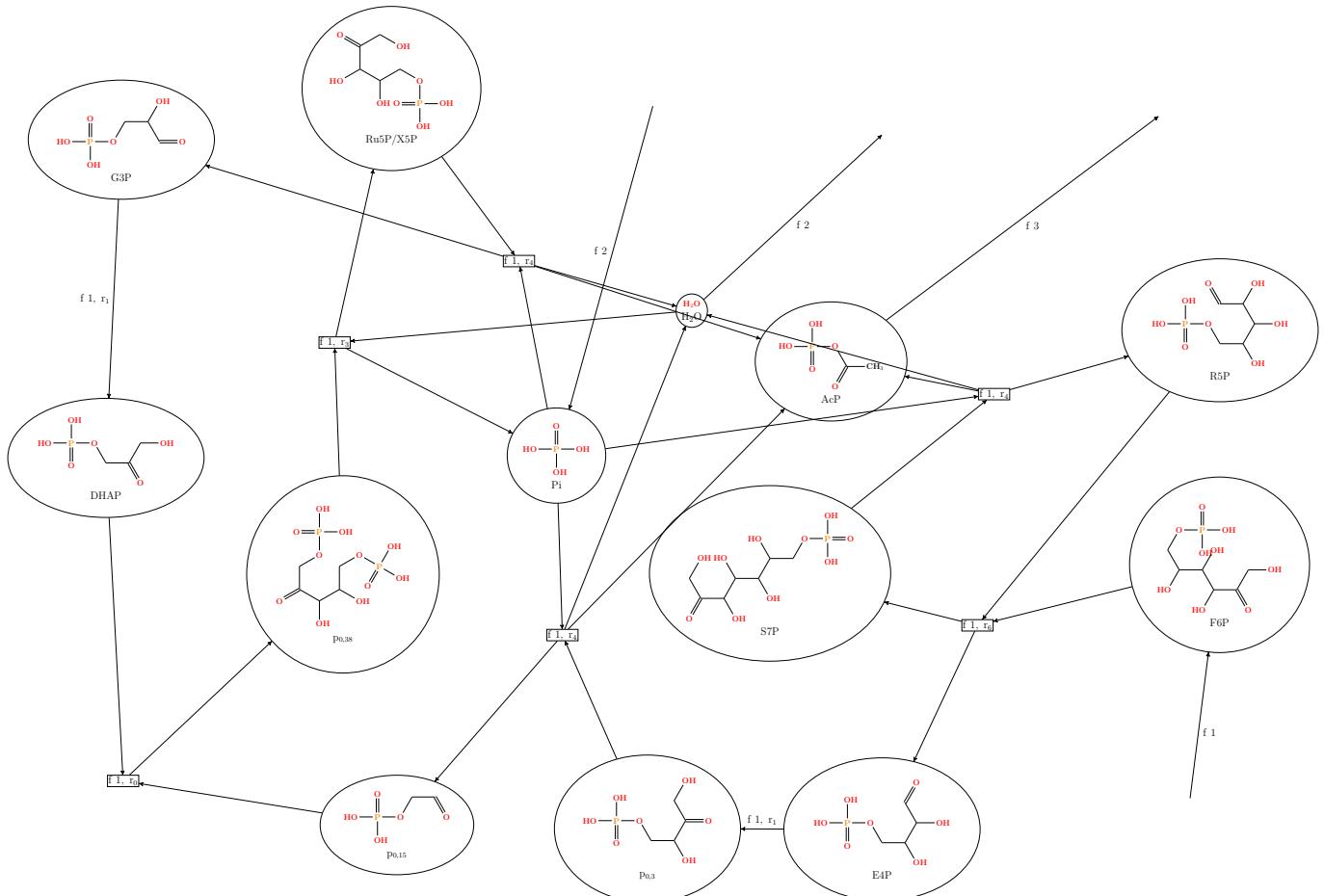
#### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

#### Filtered Graph



File: out/319\_dg\_0\_11100\_f\_0\_4\_filt

$|E| = 8 \ |P| = 8$

### 0.11.2 Solution 5

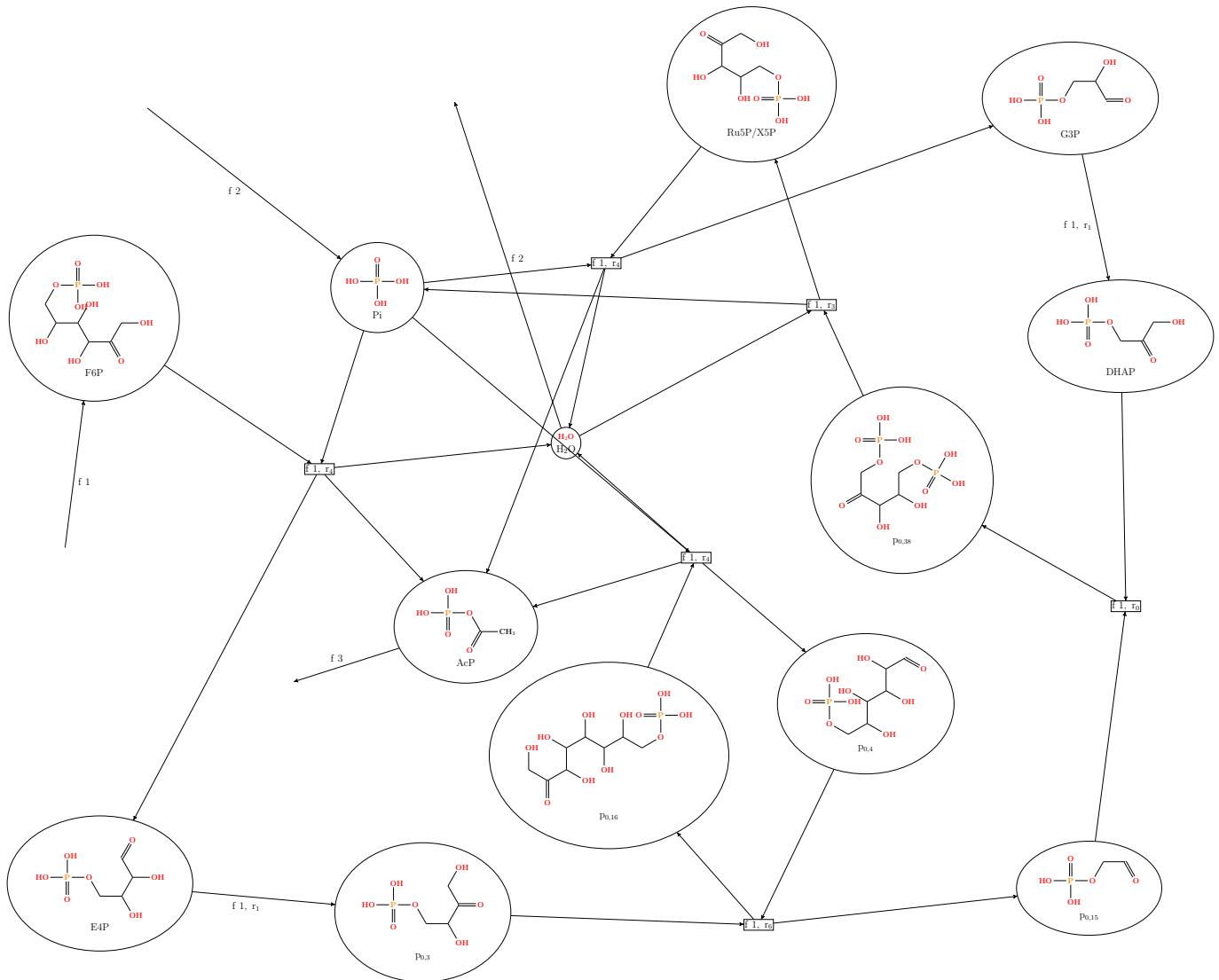
#### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2

## Filtered Graph



File: out/324\_dg\_0\_11100\_f\_0\_5\_filt

$$|E| = 8 \quad |P| = 8$$

## 0.11.3 Solution 9

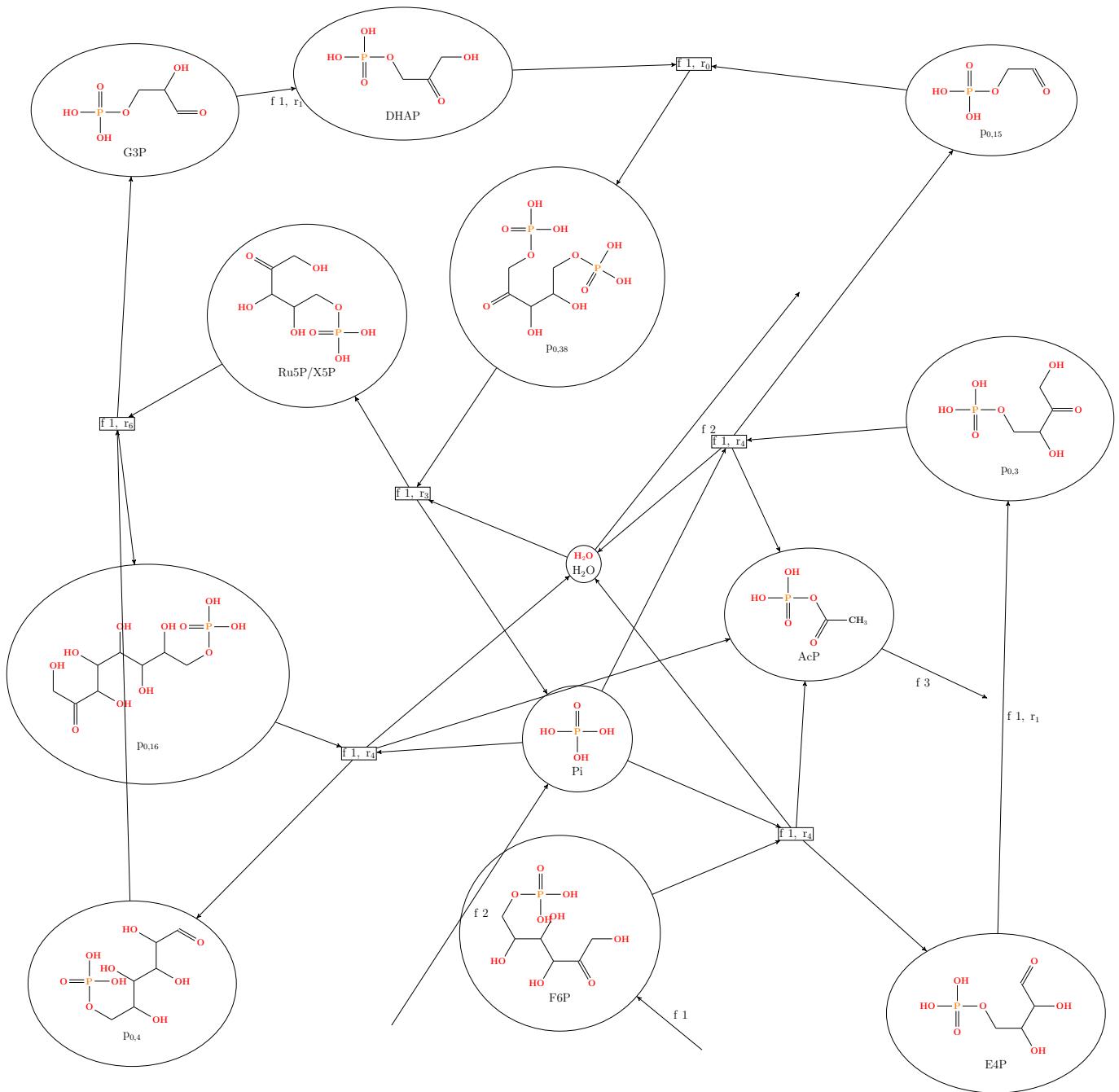
## Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/329\_dg\_0\_11100\_f\_0\_9\_filt

$$|E| = 8 \quad |P| = 8$$

### 0.11.4 Solution 10

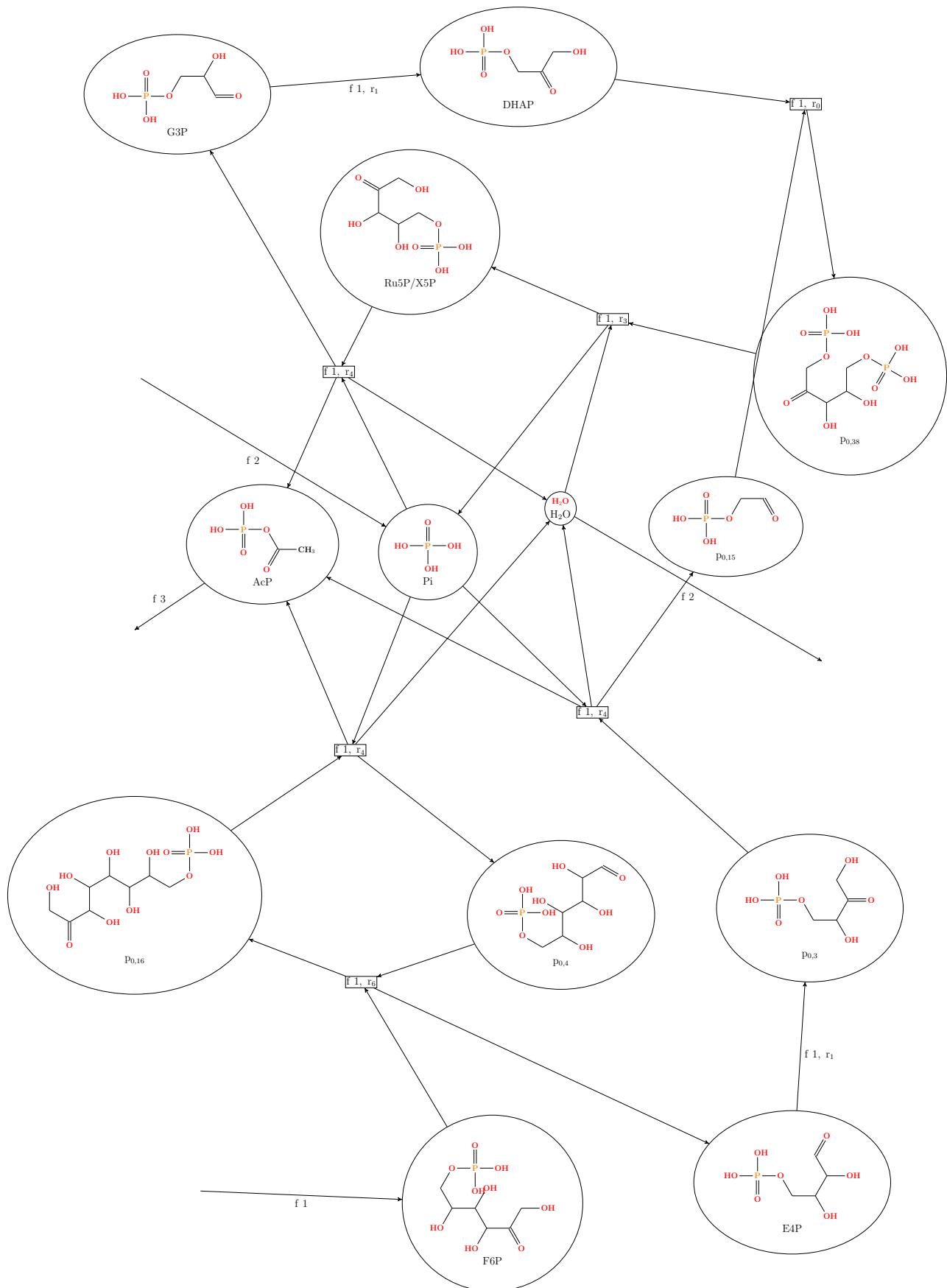
#### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/334\_dg\_0\_11100\_f\_0\_10\_filt

|E| = 8 |P| = 8

## 0.11.5 Solution 11

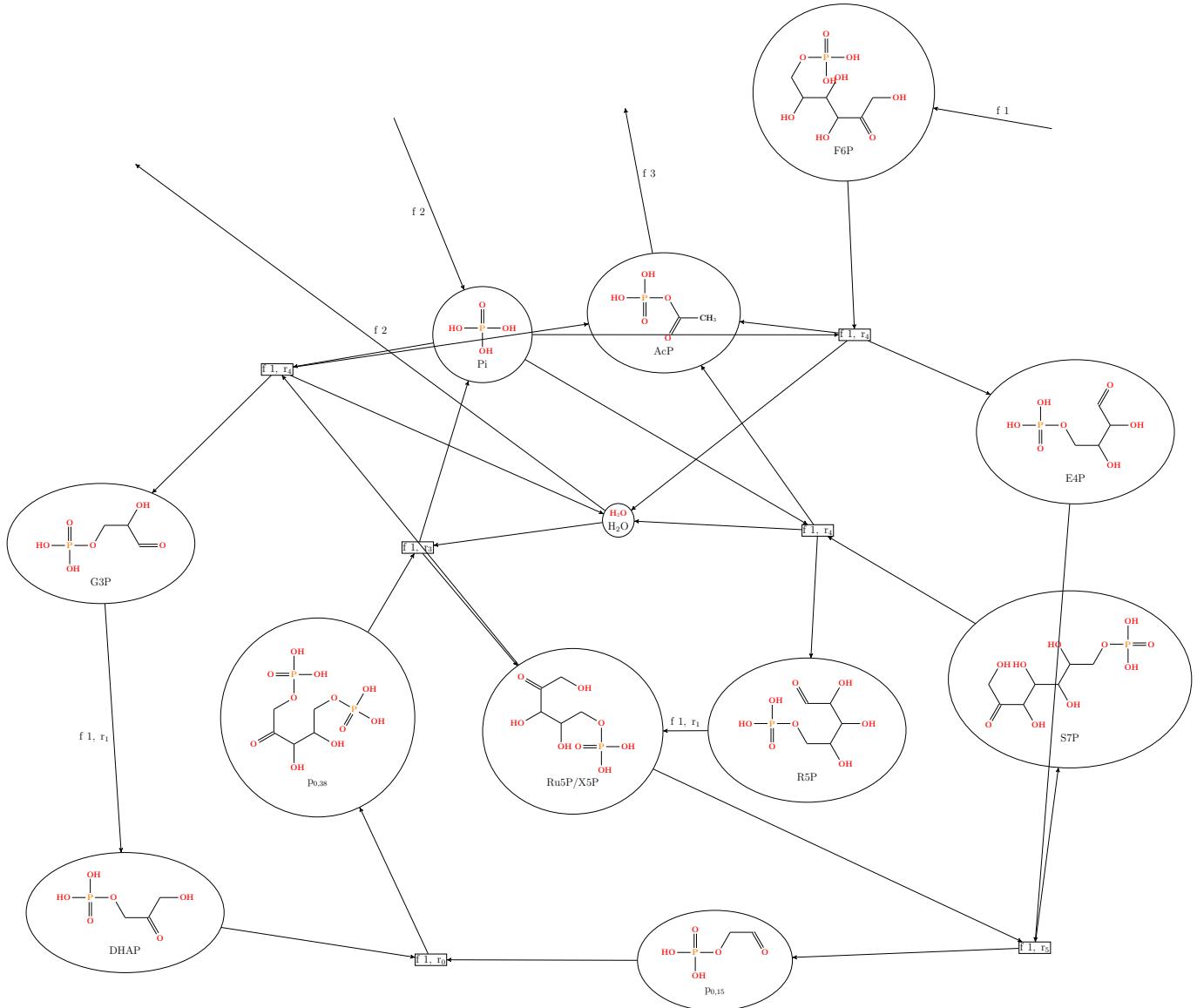
### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/339\_dg\_0\_11100\_f\_0\_11\_filt

$|E| = 8$   $|P| = 8$

## 0.11.6 Solution 12

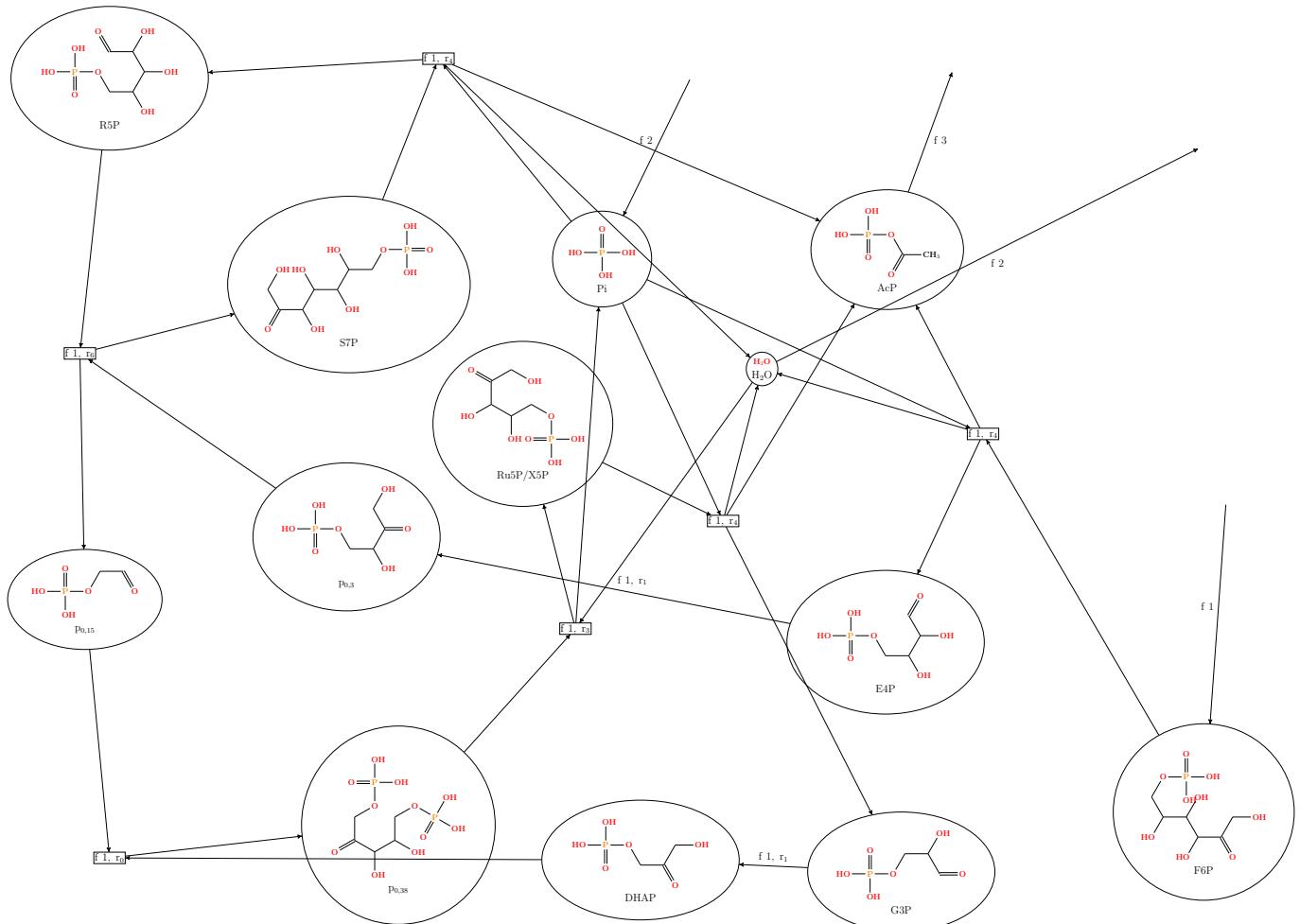
### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

### Filtered Graph



File: out/344\_dg\_0\_11100\_f\_0\_12\_filt

$$|E| = 8 \quad |P| = 8$$

### 0.11.7 Solution 13

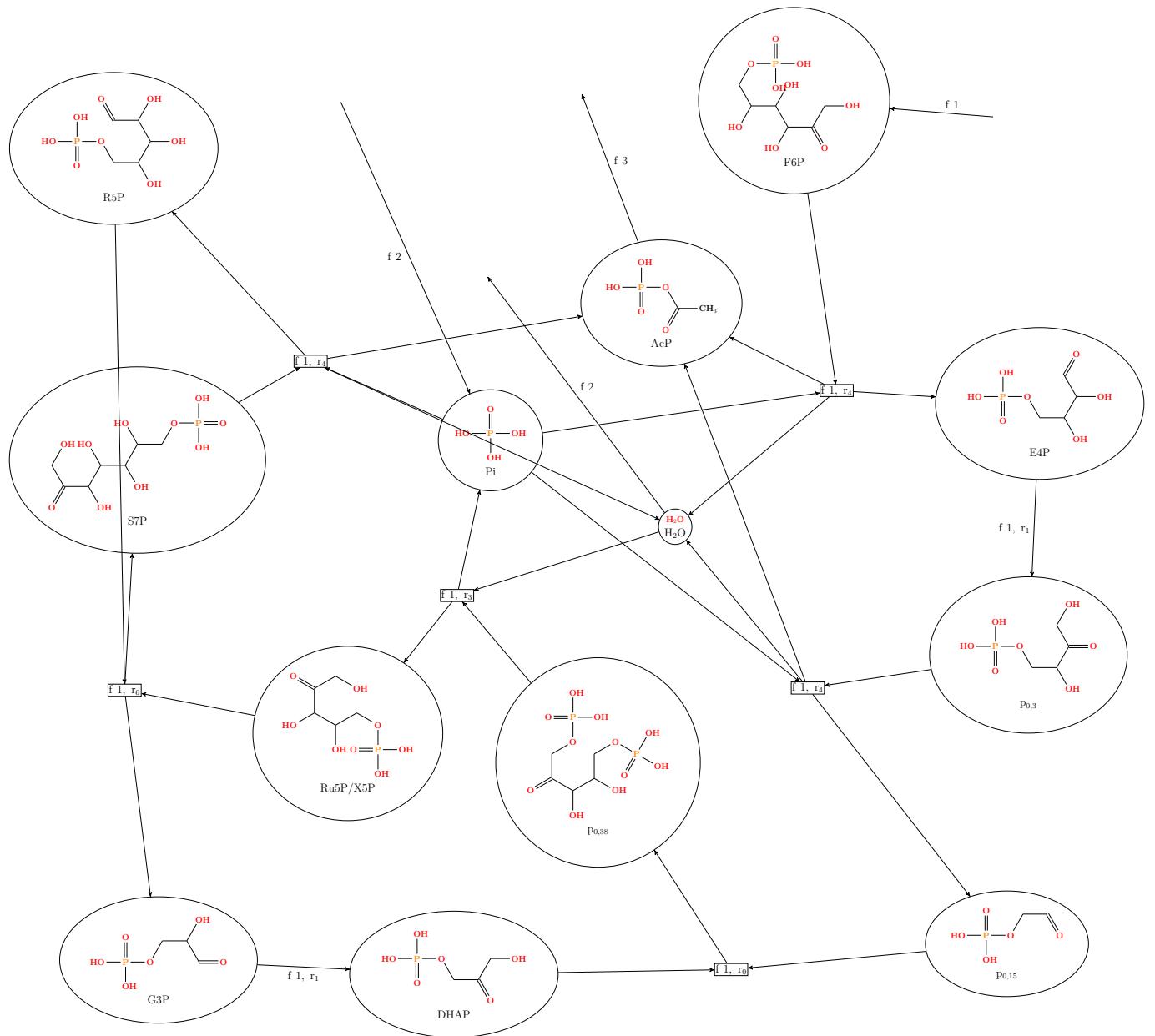
#### Overall Data

Objective value (integral): 8

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/349\_dg\_0\_11100\_f\_0\_13\_filt

$$|E| = 8 \quad |P| = 8$$

- 0.12 Enumerated Flows with 9 unique reactions
- 0.13 Enumerated Flows with 10 unique reactions
- 0.14 Enumerated Flows with 11 unique reactions
- 0.15 Enumerated Flows with 9 reactions
- 0.16 Enumerated Flows with 7 unique reactions

#### 0.16.1 Solution 31

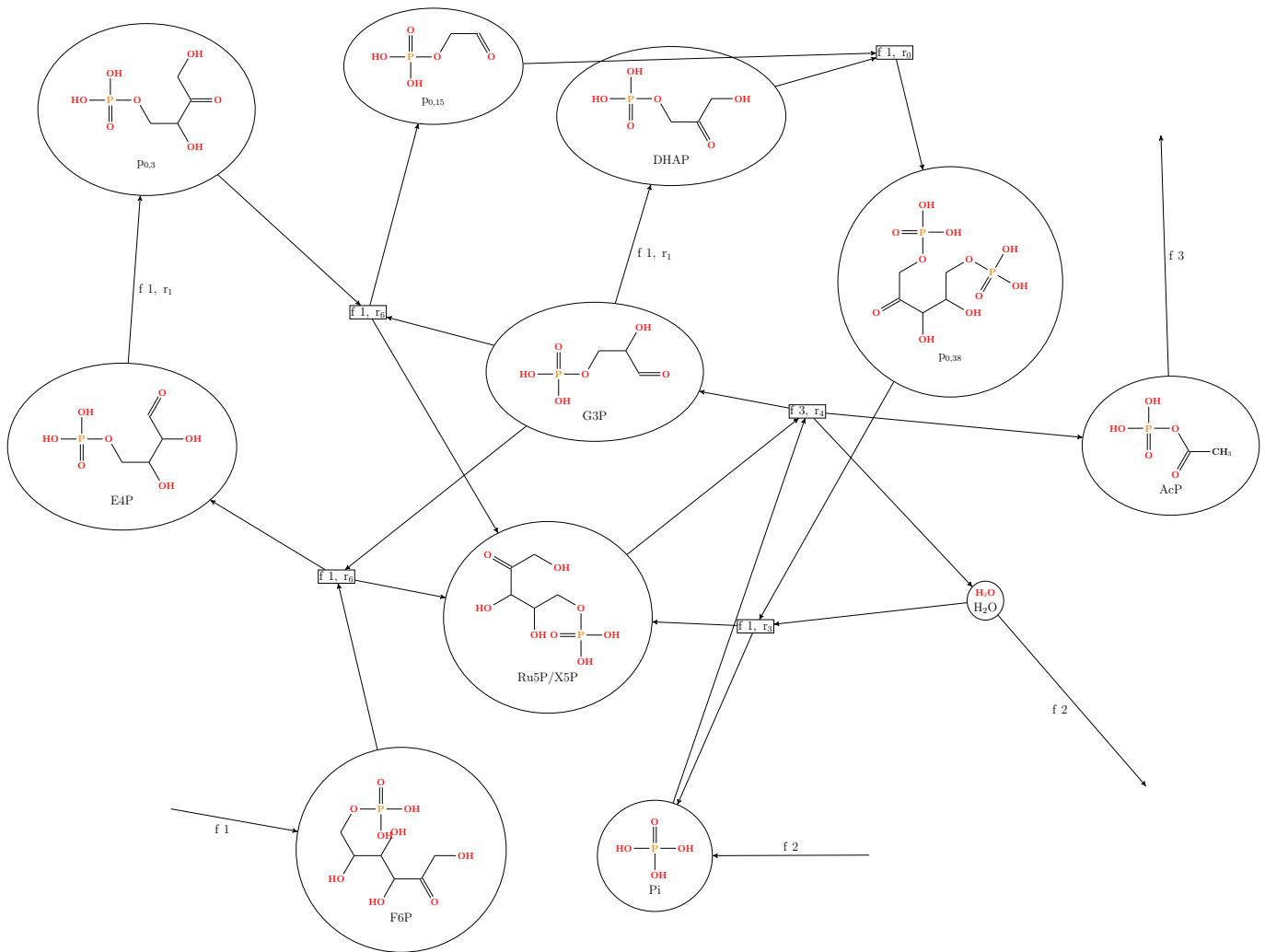
##### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/354\_dg\_0\_11100\_f\_0\_31\_filt

$$|E| = 7 \quad |P| = 9$$

### 0.16.2 Solution 40

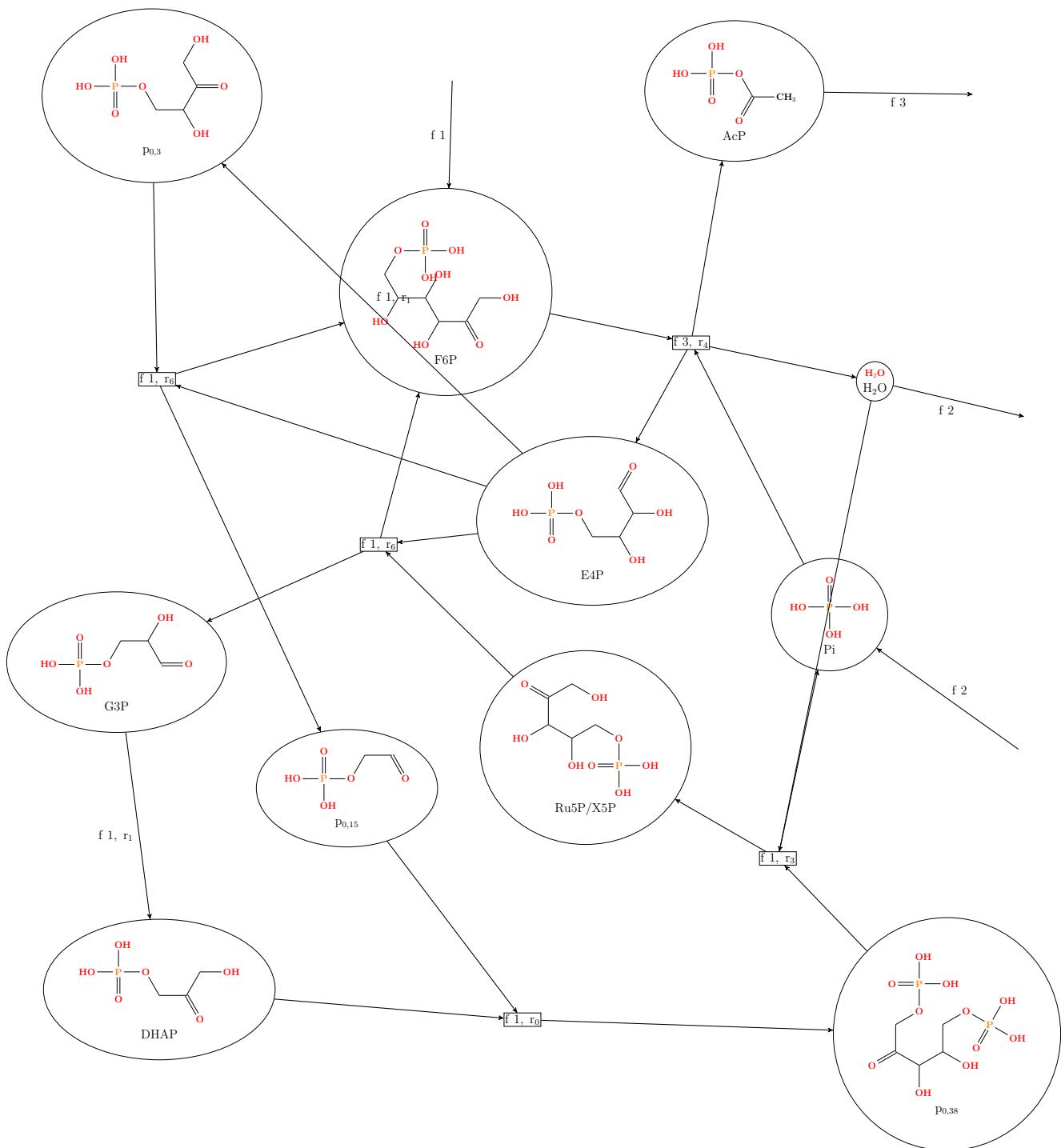
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/359\_dg\_0\_11100\_f\_0\_40\_filt

$$|E| = 7 \quad |P| = 9$$

### 0.16.3 Solution 51

#### Overall Data

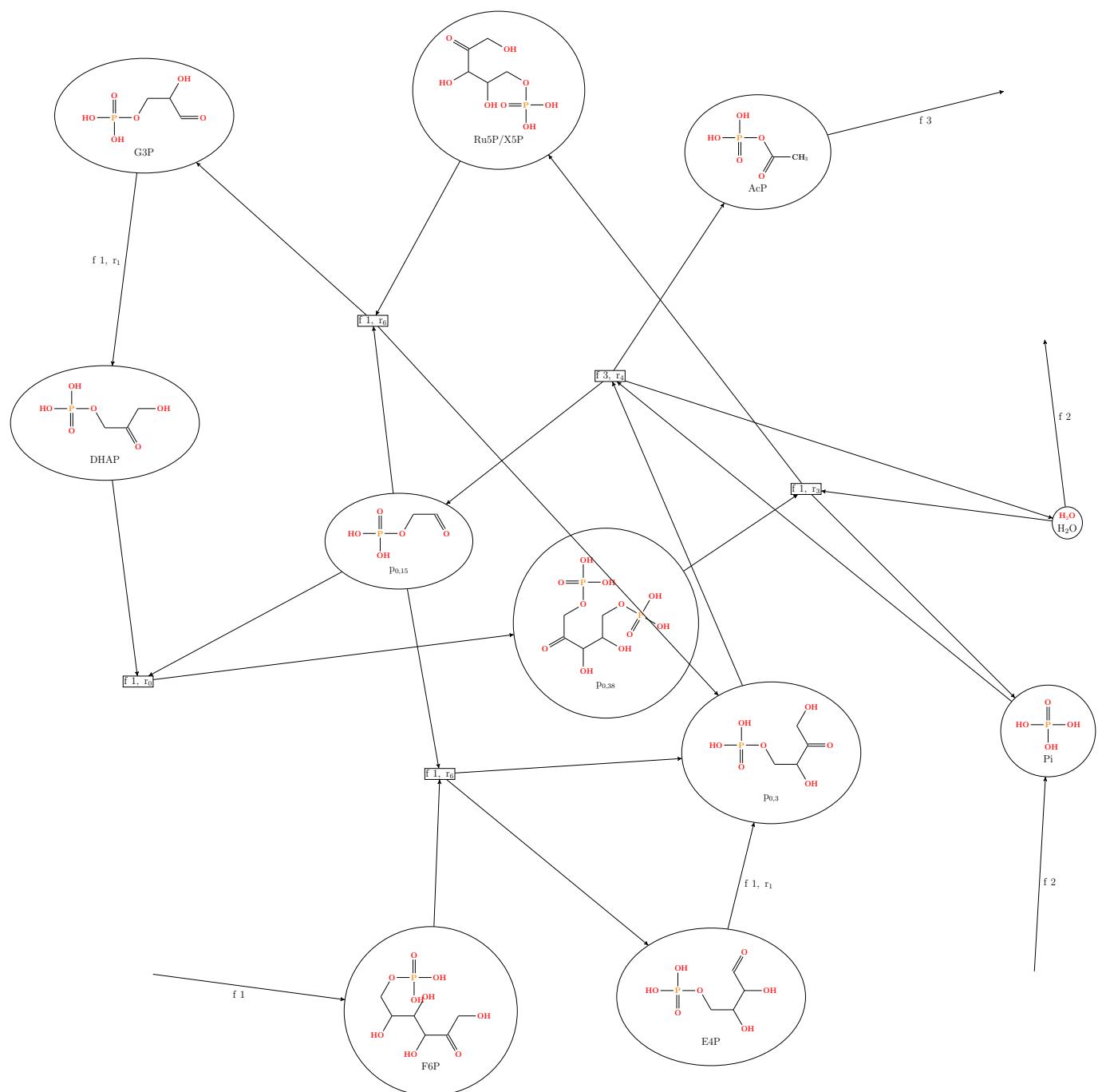
Objective value (integral): 9

Vertex/Graph In Out

AcP 0 3

F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/364\_dg\_0\_11100\_f\_0\_51\_filt

$|E| = 7 \quad |P| = 9$

## 0.17 Enumerated Flows with 8 unique reactions

### 0.17.1 Solution 14

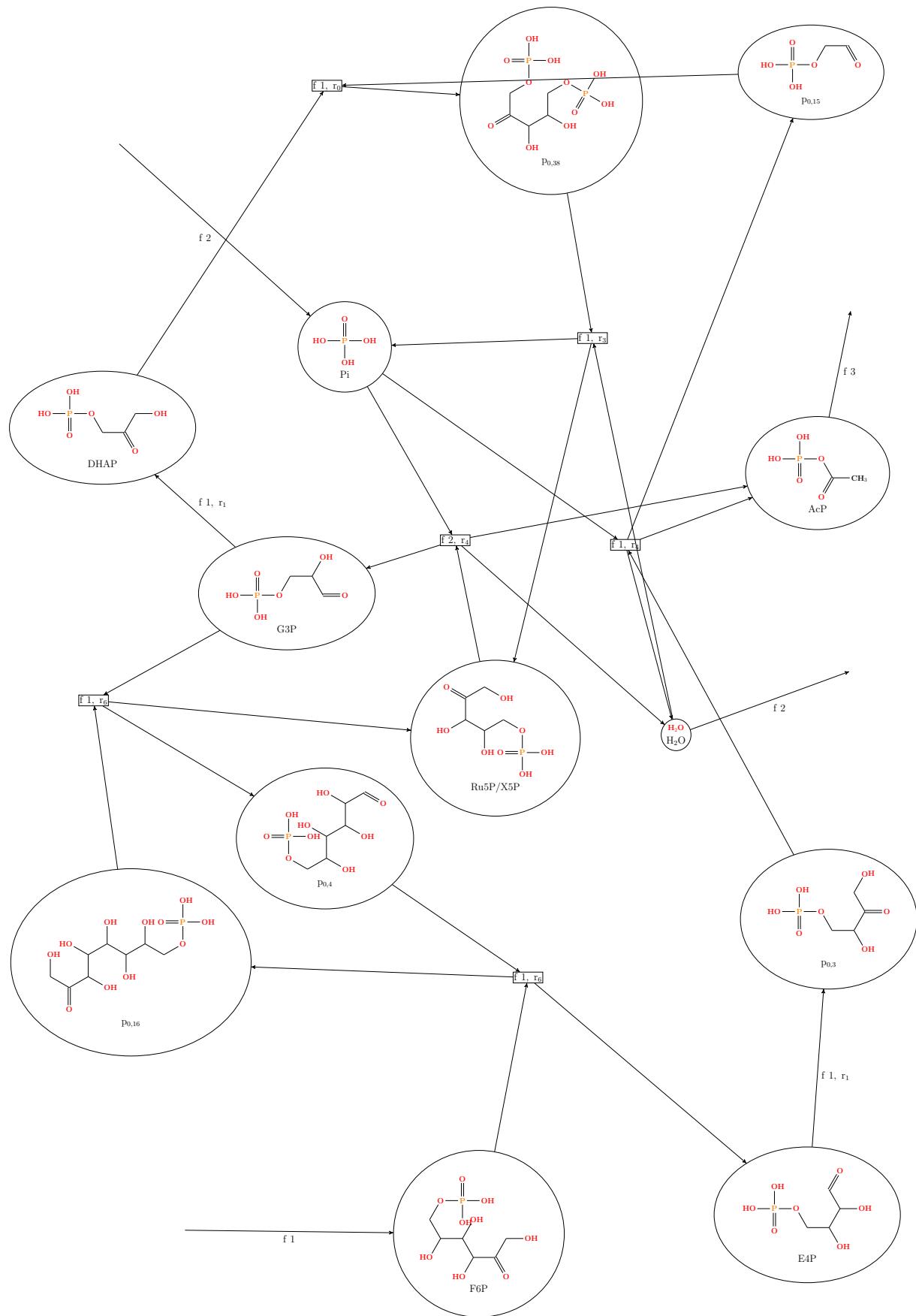
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/369\_dg\_0\_11100\_f\_0\_14\_filt

|E| = 8 |P| = 9

## 0.17.2 Solution 15

### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

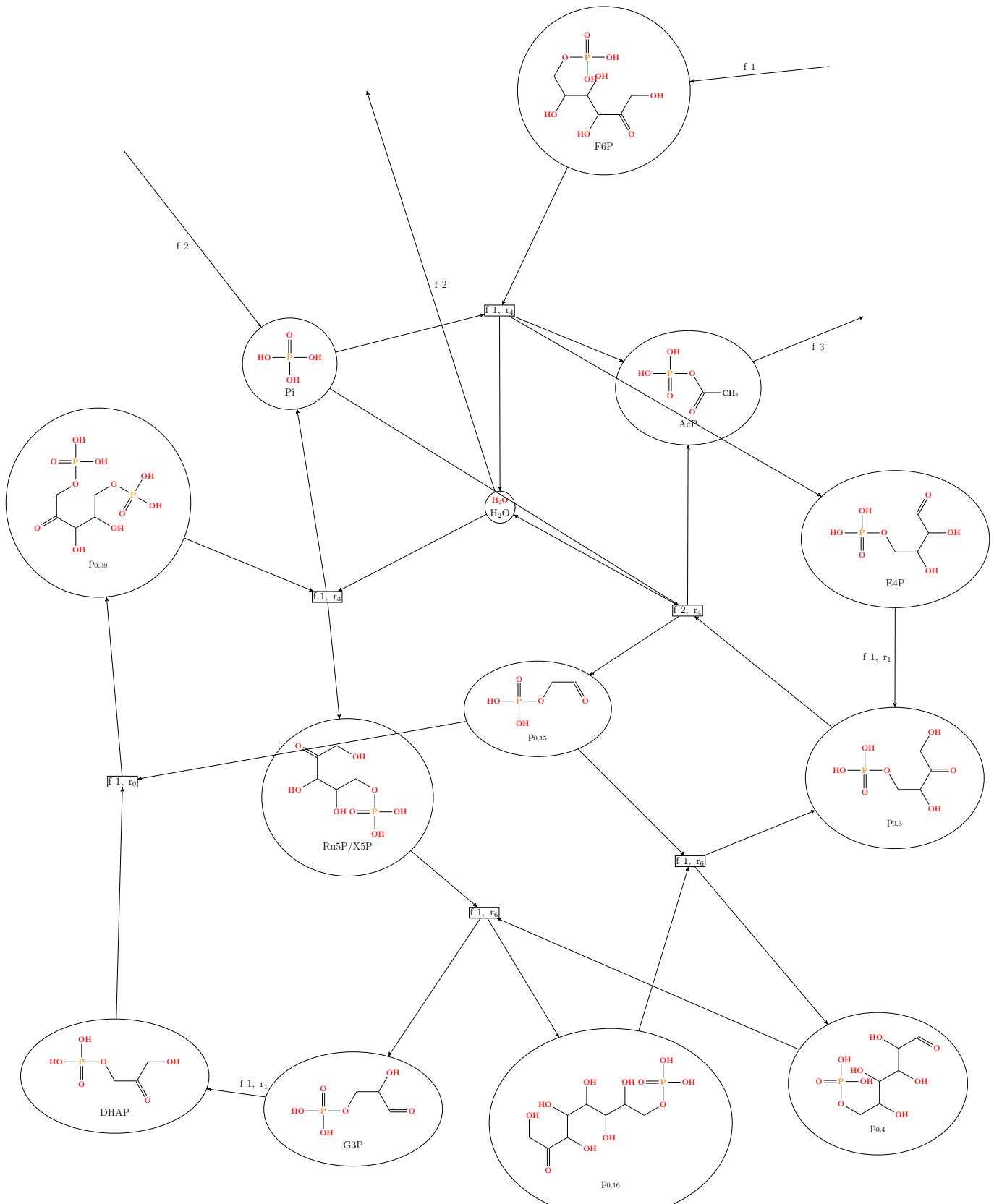
AcP 0 3

F6P 1 0

H\_2O 0 2

Pi 2 0

## Filtered Graph



File: out/374\_dg\_0\_11100\_f\_0\_15\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.3 Solution 16

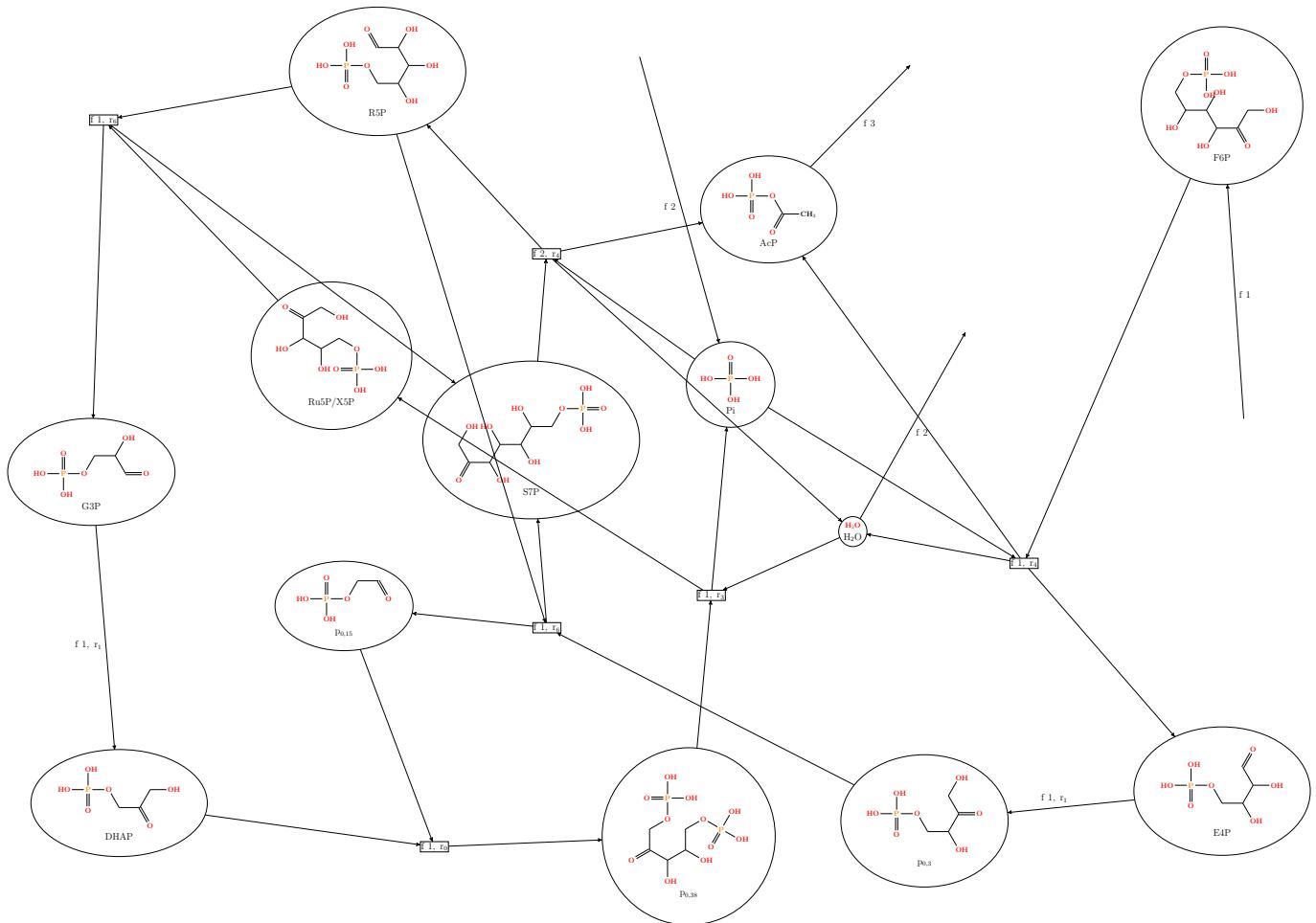
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

#### Filtered Graph



File: out/379\_dg\_0\_11100\_f\_0\_16\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.4 Solution 17

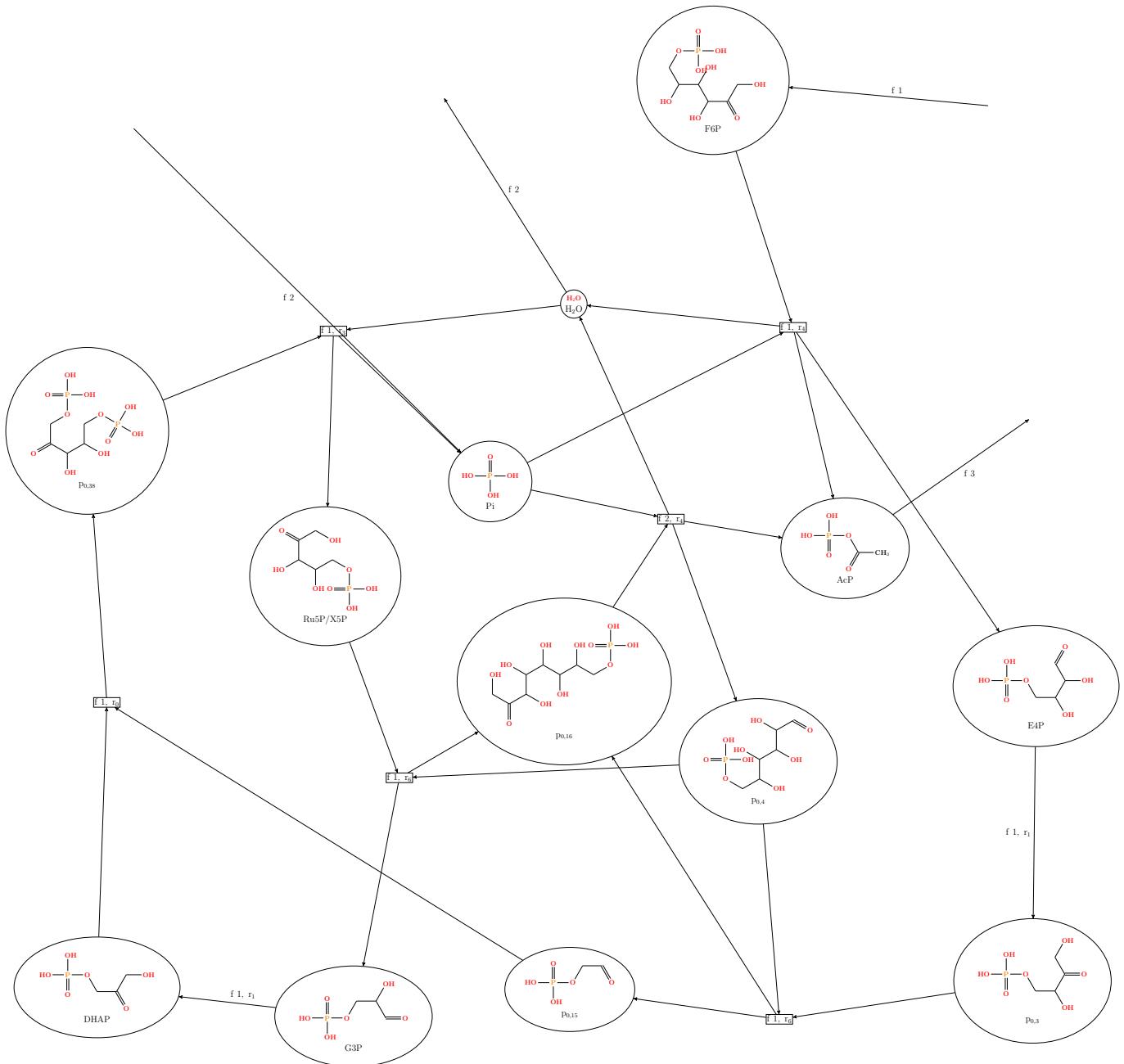
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/384\_dg\_0\_11100\_f\_0\_17\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.5 Solution 20

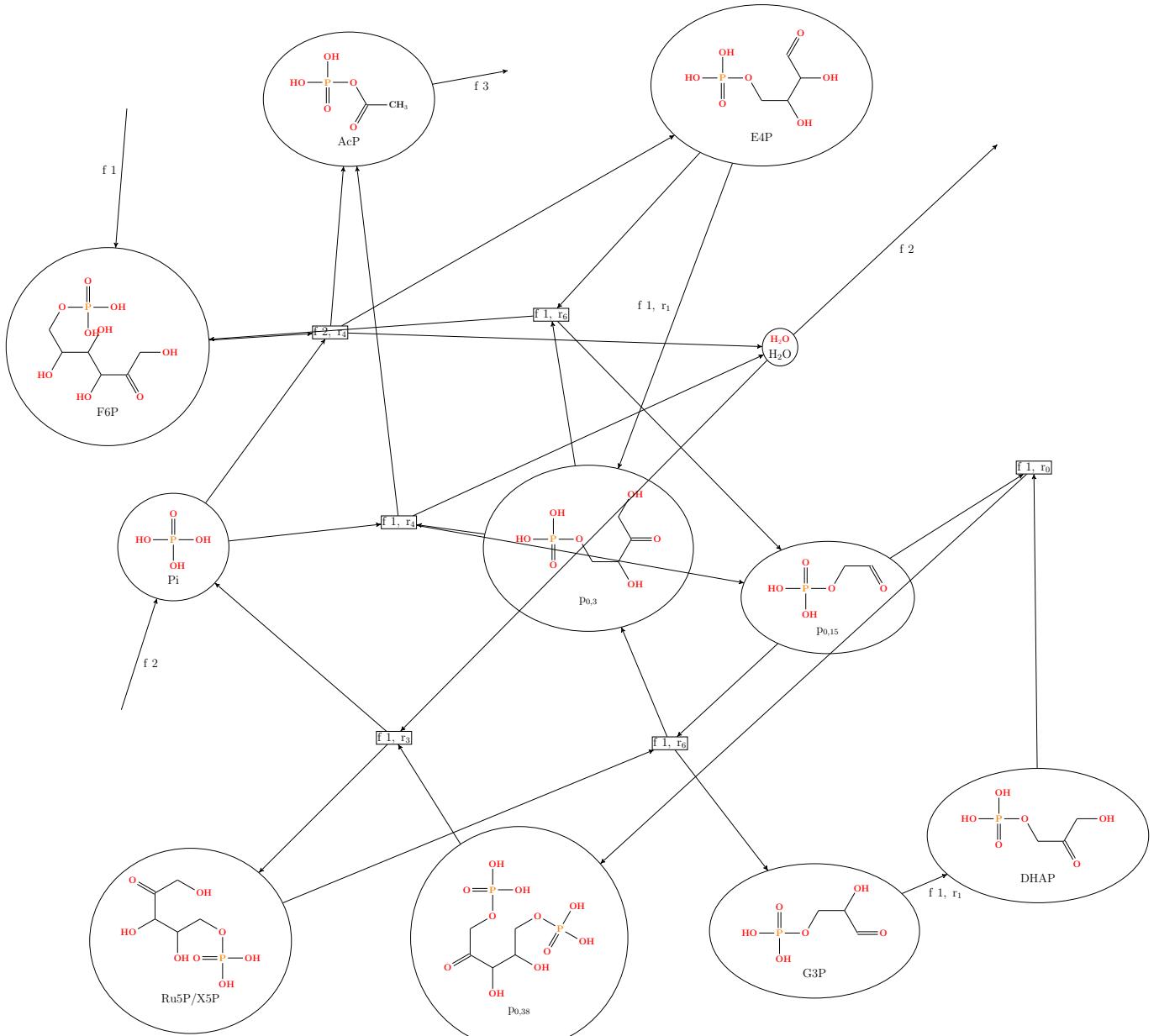
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/389\_dg\_0\_11100\_f\_0\_20\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.6 Solution 23

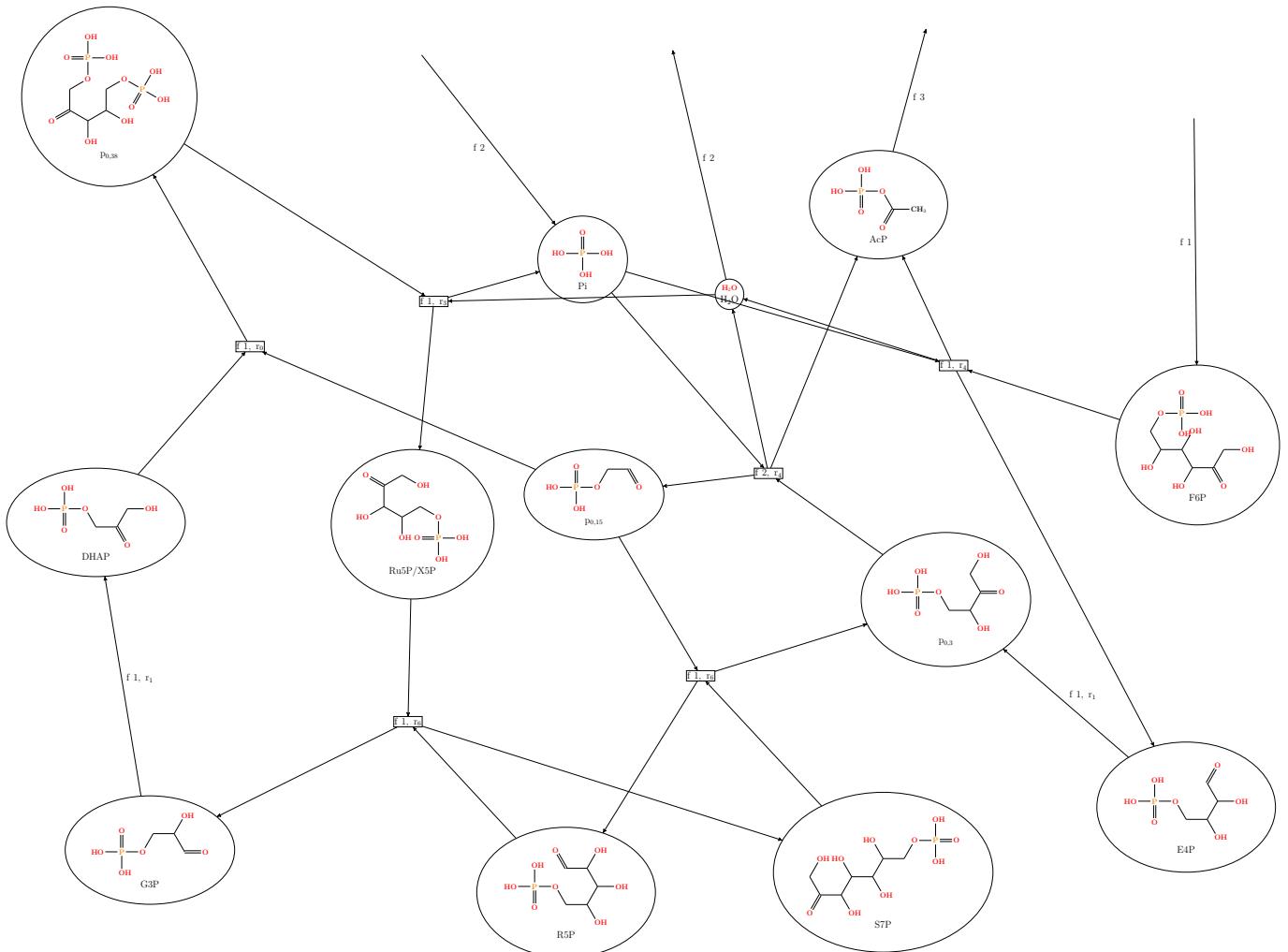
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/394\_dg\_0\_11100\_f\_0\_23\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.7 Solution 24

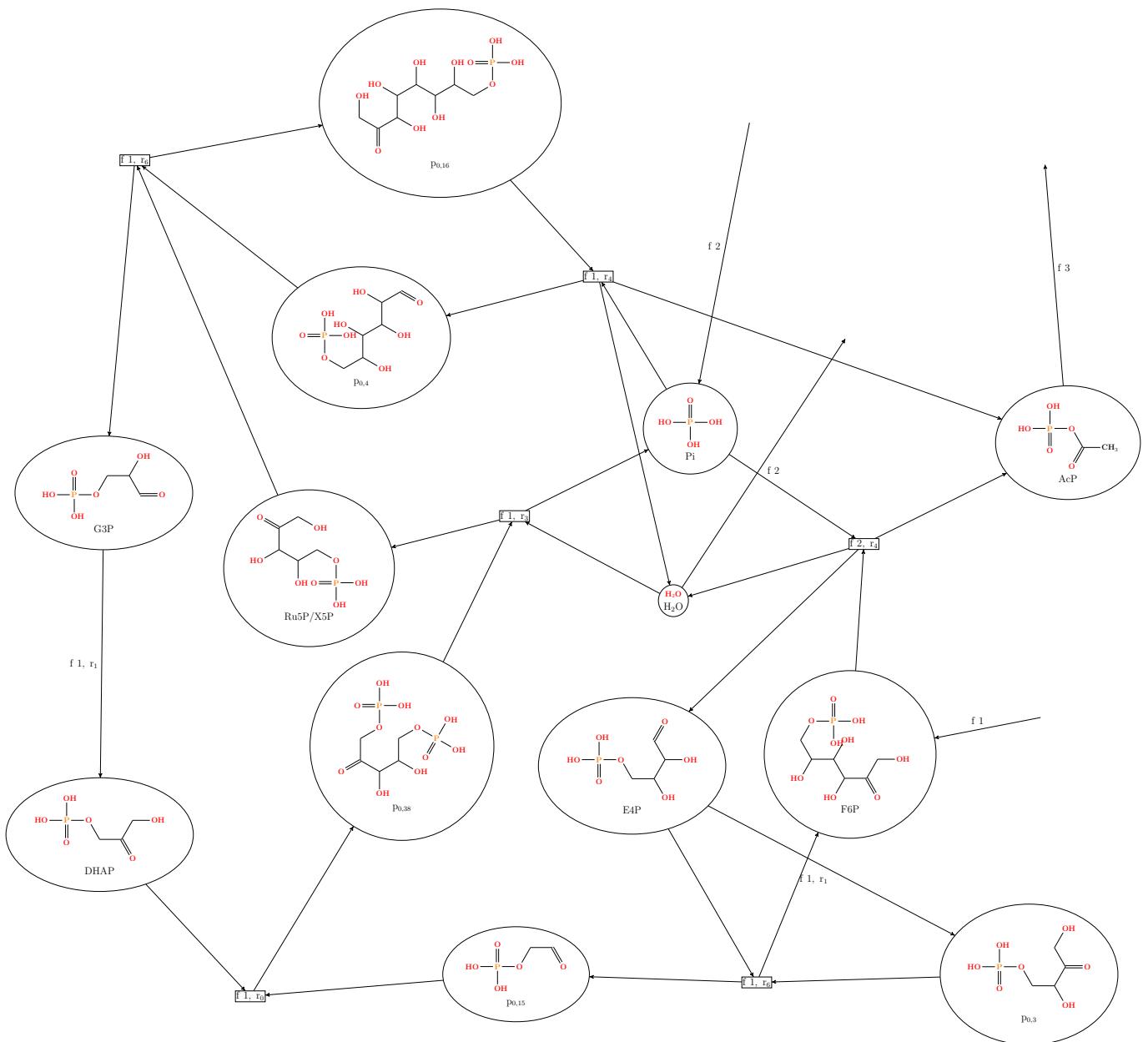
## Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



$$|E|=8 \quad |P|=9$$

### 0.17.8 Solution 26

## Overall Data

Objective value (integral): 9

## Objective Value (In Vertex/Graph In Out)

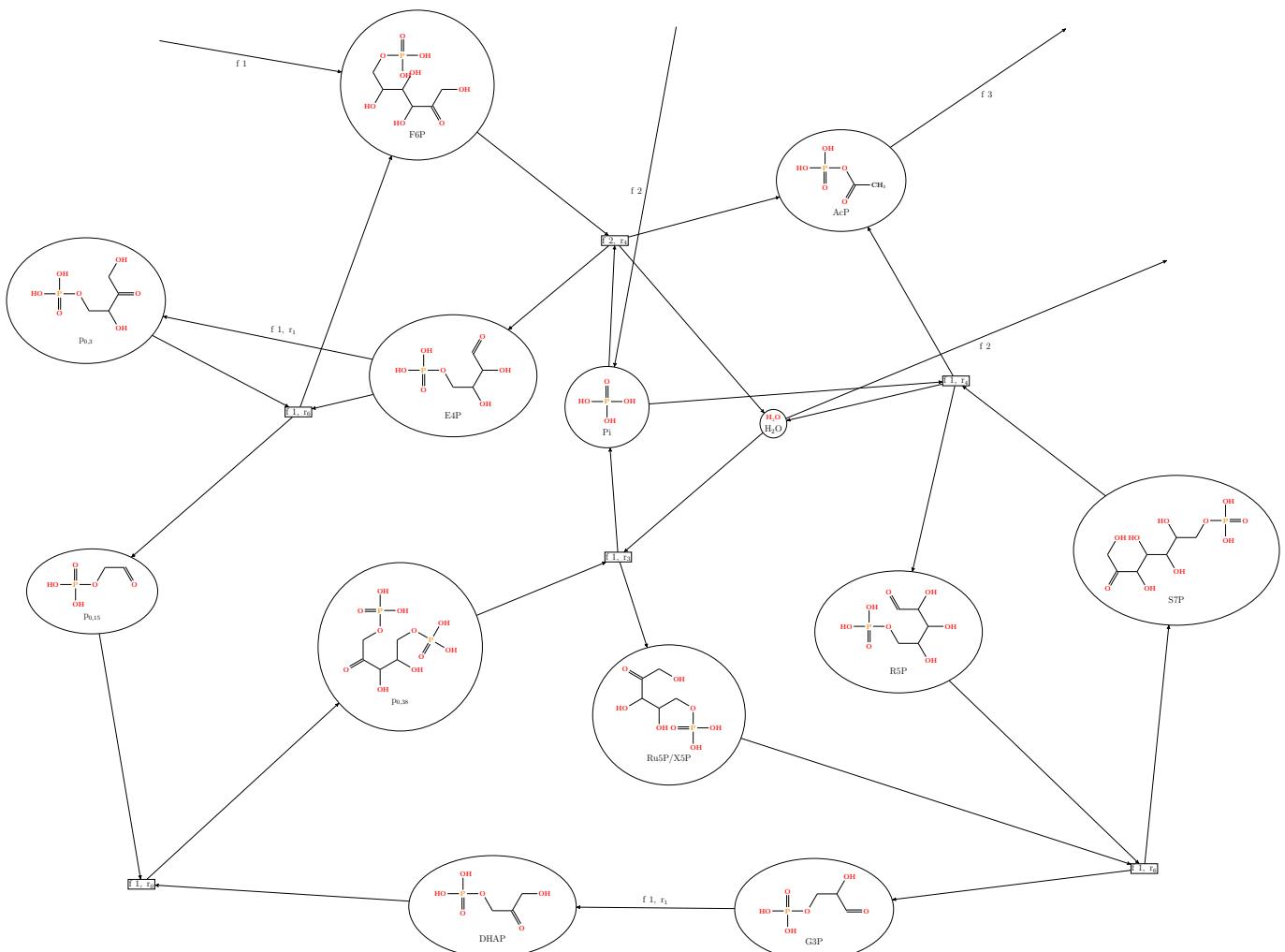
version, graph in JS

ACF 0 3  
E6P 1 0

For I 0  
H 20 0 2

n\_20 0 2  
Pi 2 0

## Filtered Graph



File: out/404\_dg\_0\_11100\_f\_0\_26\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.9 Solution 27

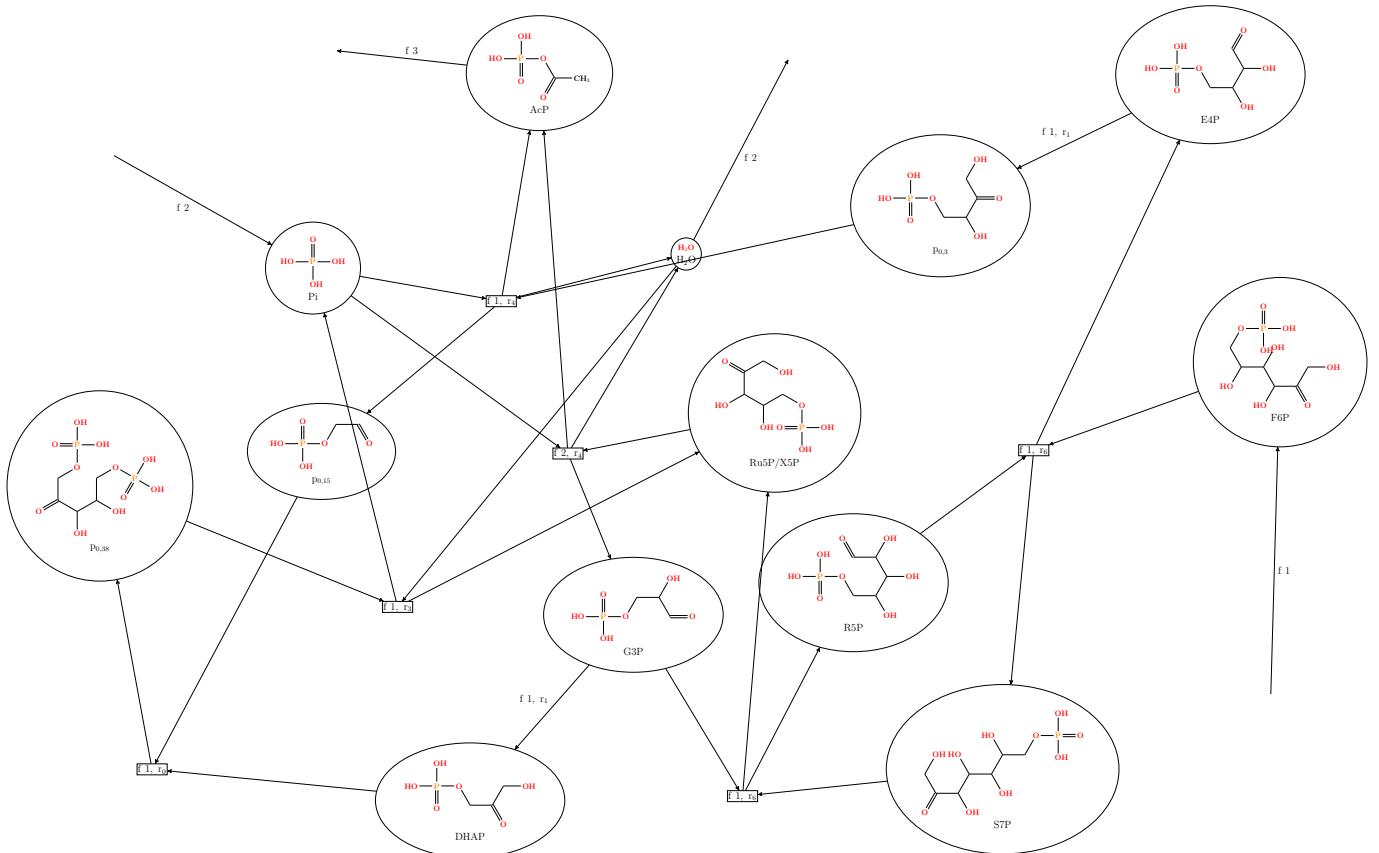
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/409\_dg\_0\_11100\_f\_0\_27\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.10 Solution 29

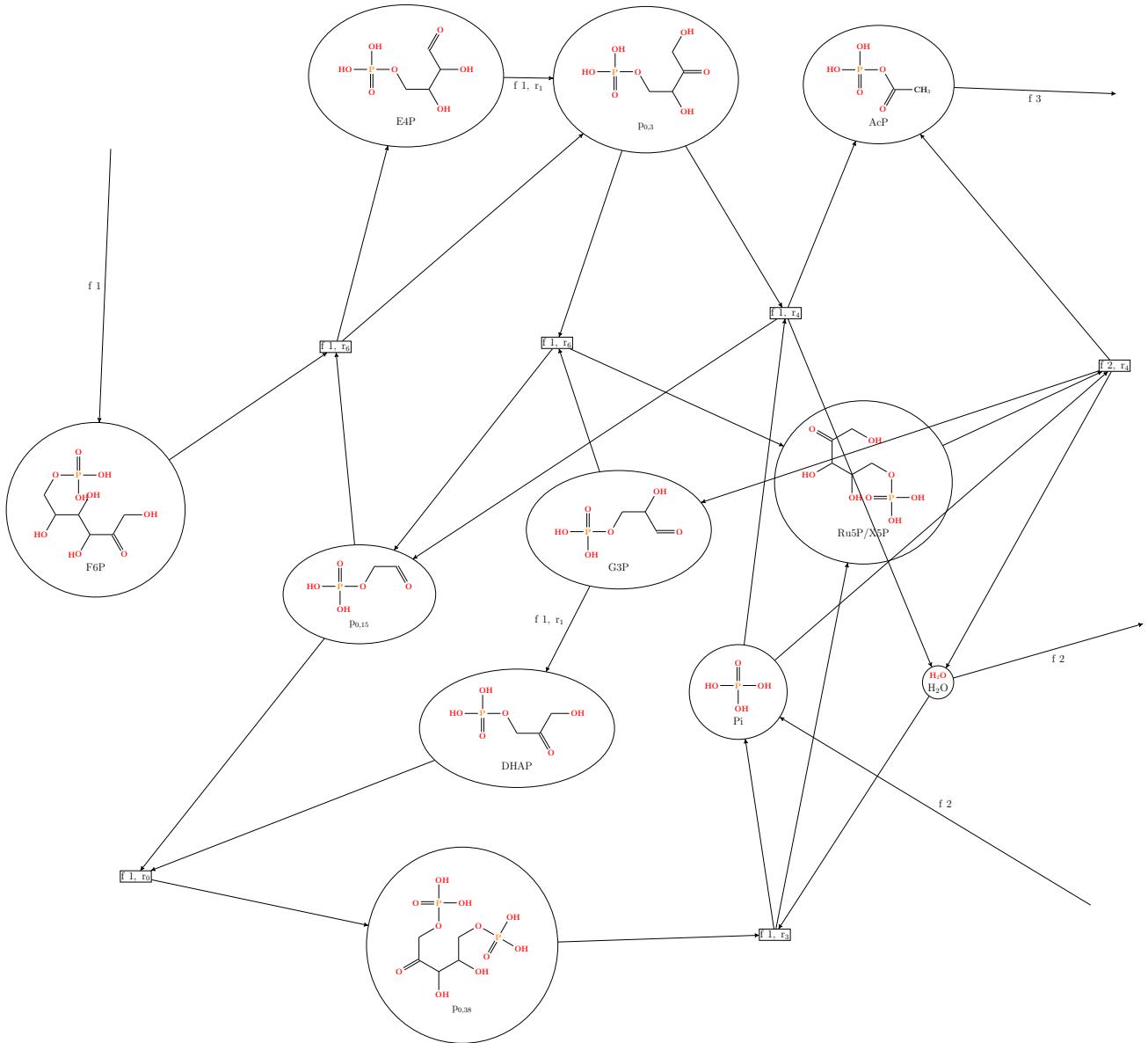
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/414\_dg\_0\_11100\_f\_0\_29\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.11 Solution 32

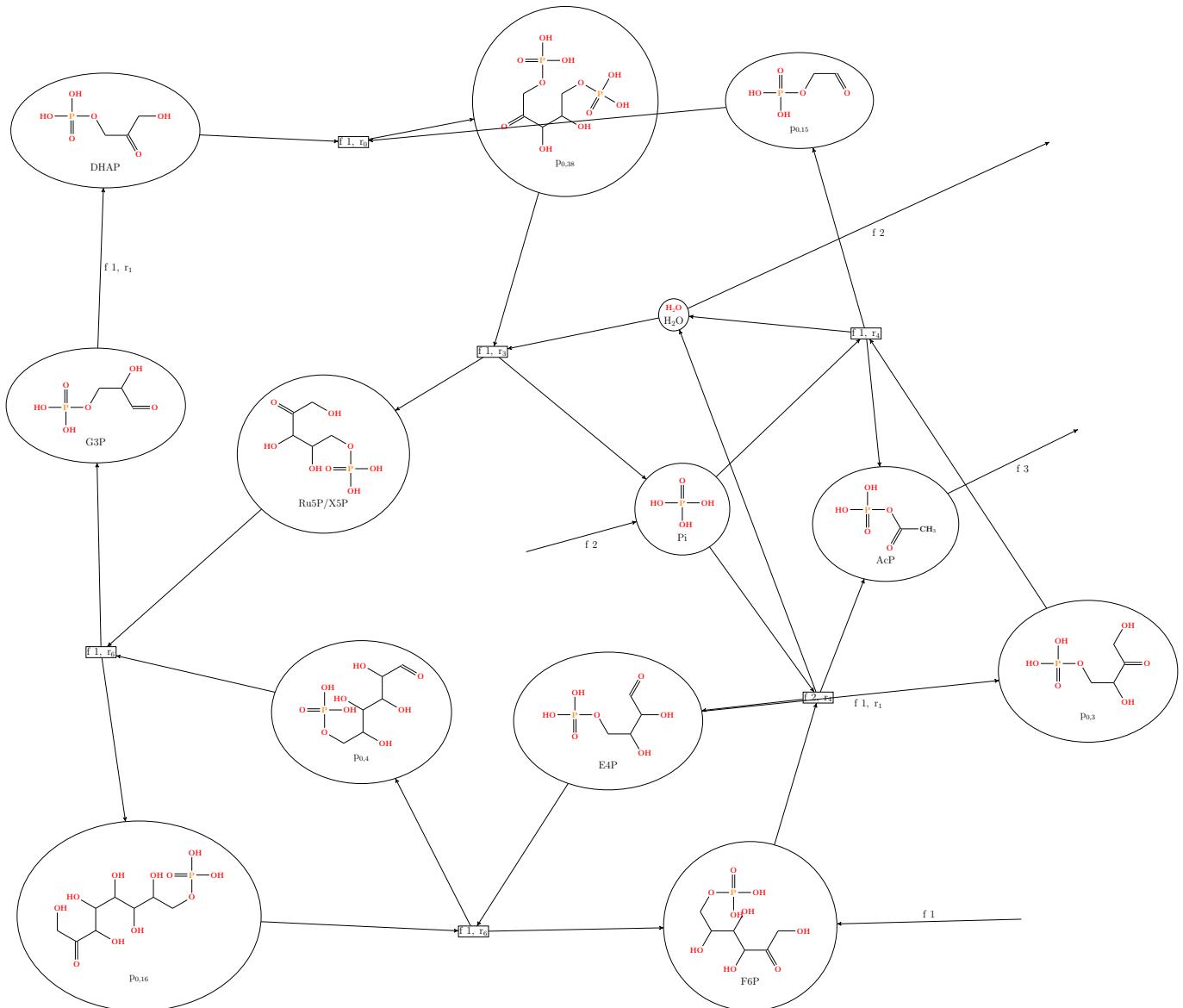
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/419\_dg\_0\_11100\_f\_0\_32\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.12 Solution 38

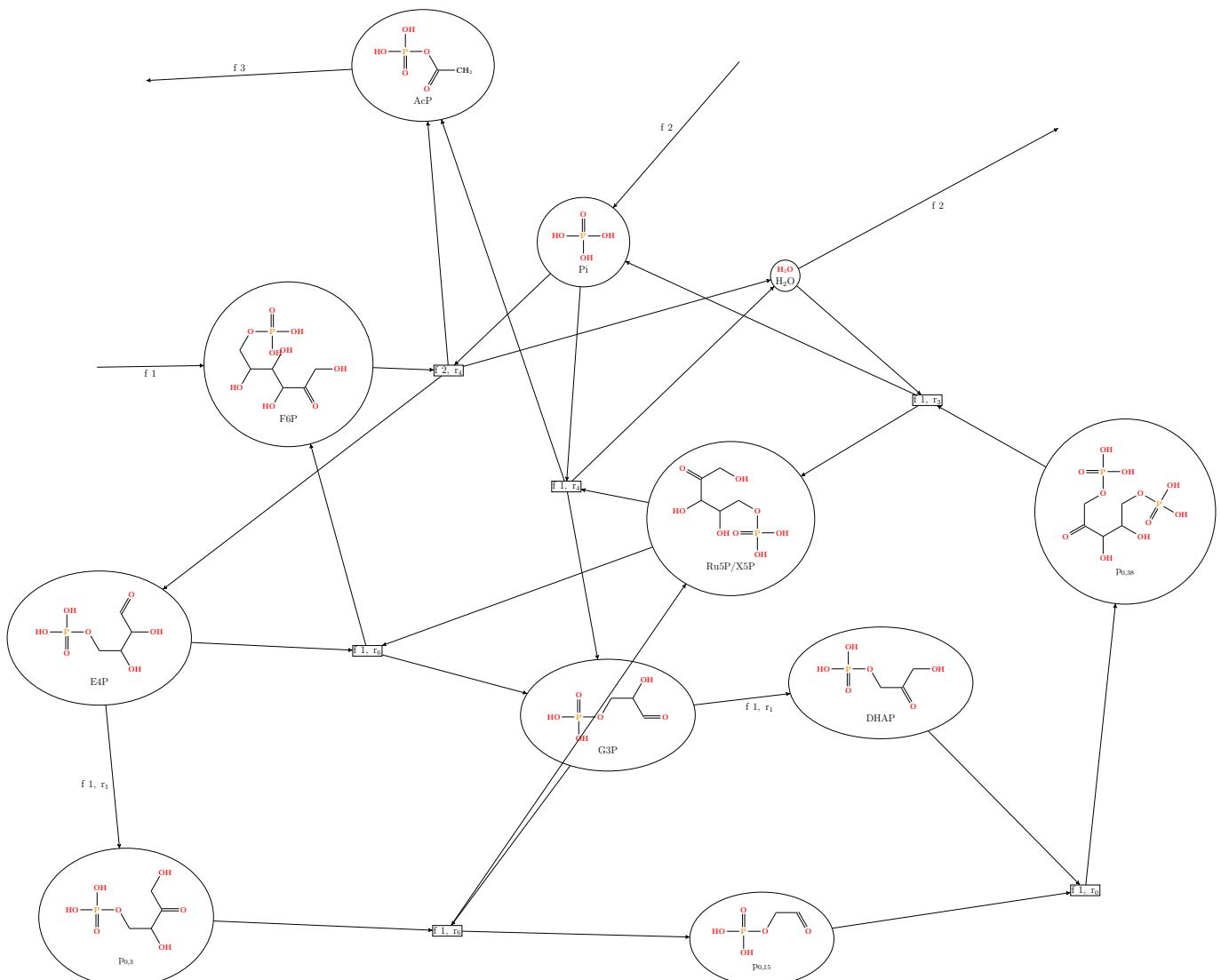
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/424\_dg\_0\_11100\_f\_0\_38\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.13 Solution 41

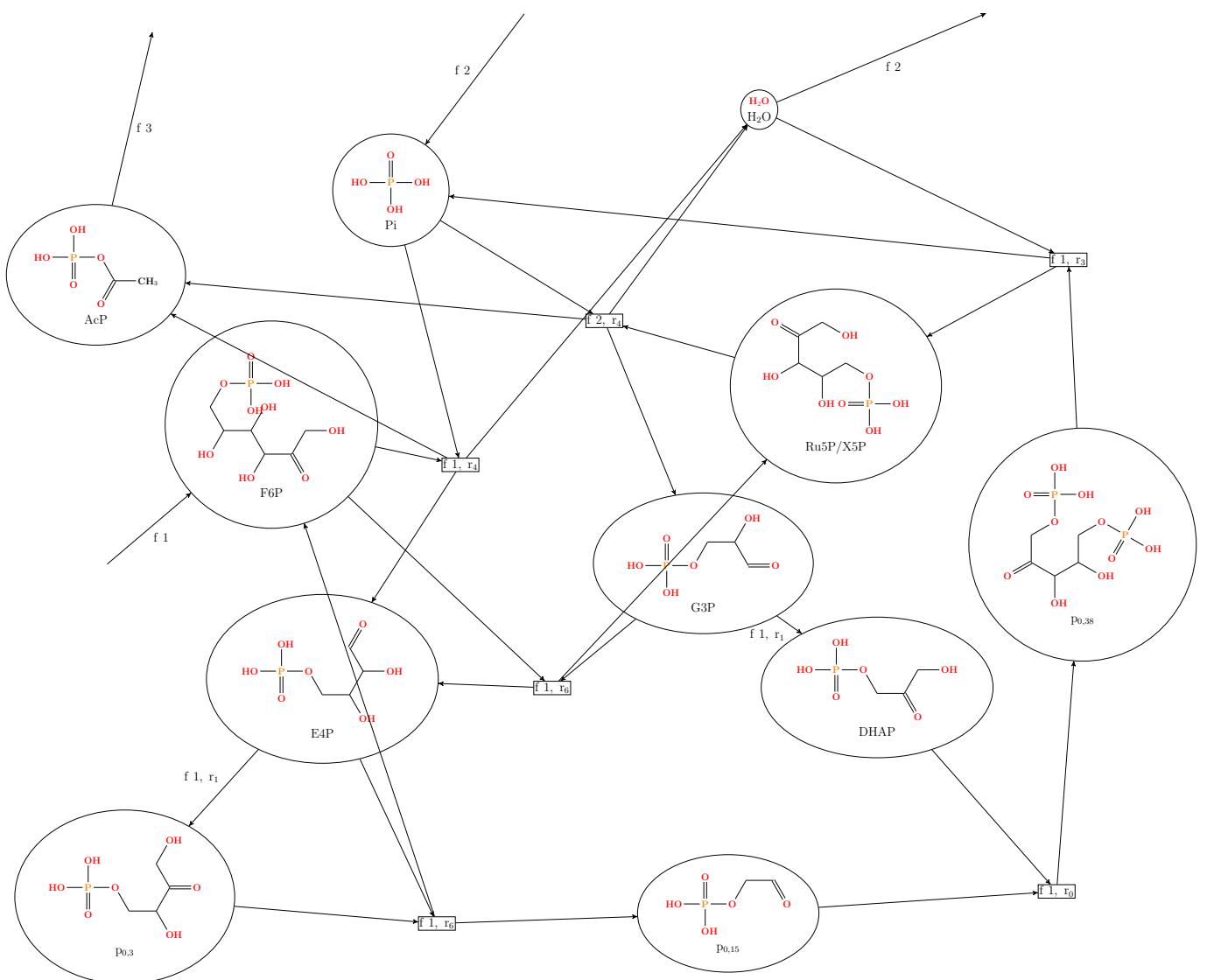
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/429\_dg\_0\_11100\_f\_0\_41\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.14 Solution 43

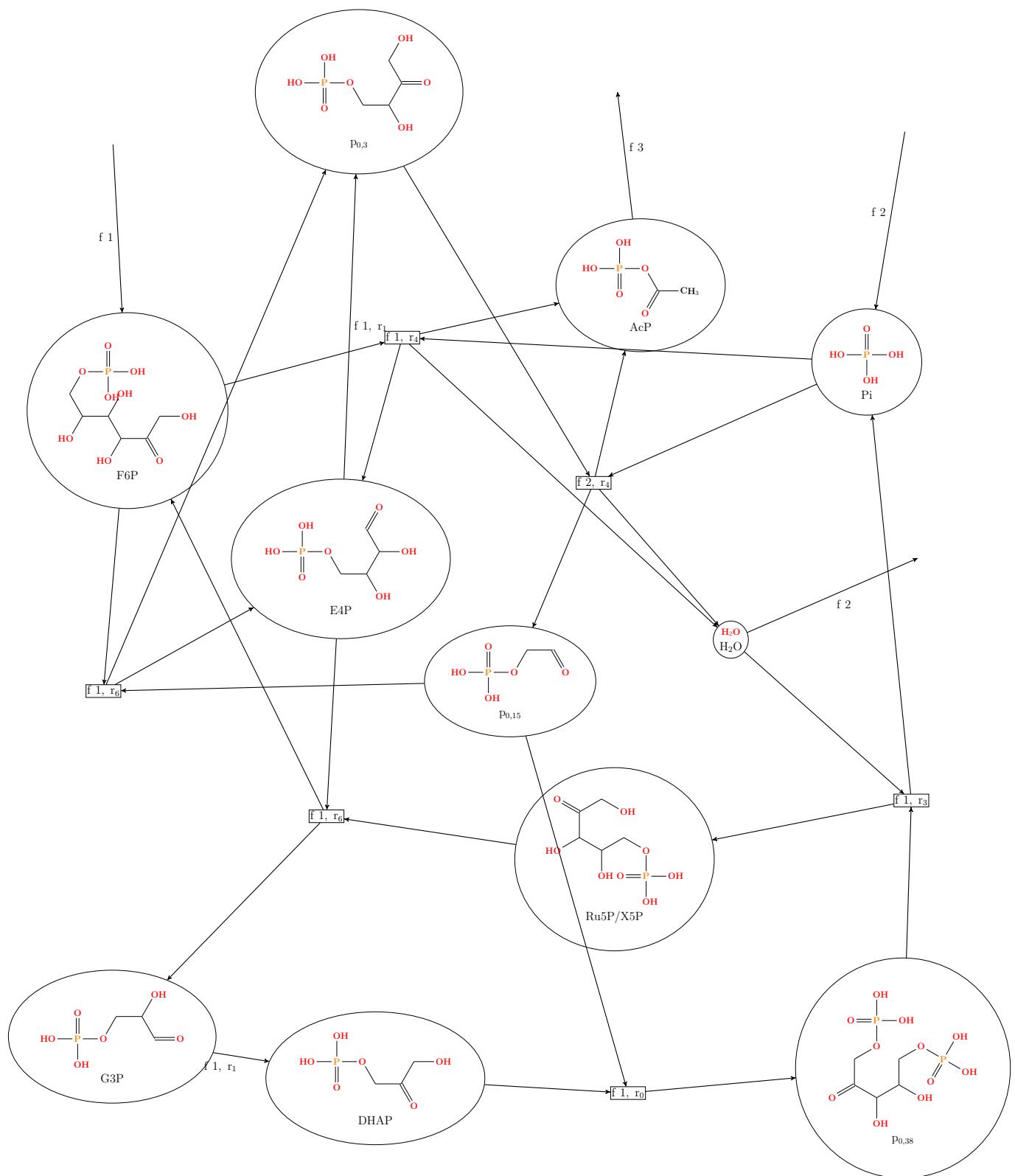
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/434\_dg\_0\_11100\_f\_0\_43\_filt

$|E| = 8 \quad |P| = 9$

## 0.17.15 Solution 44

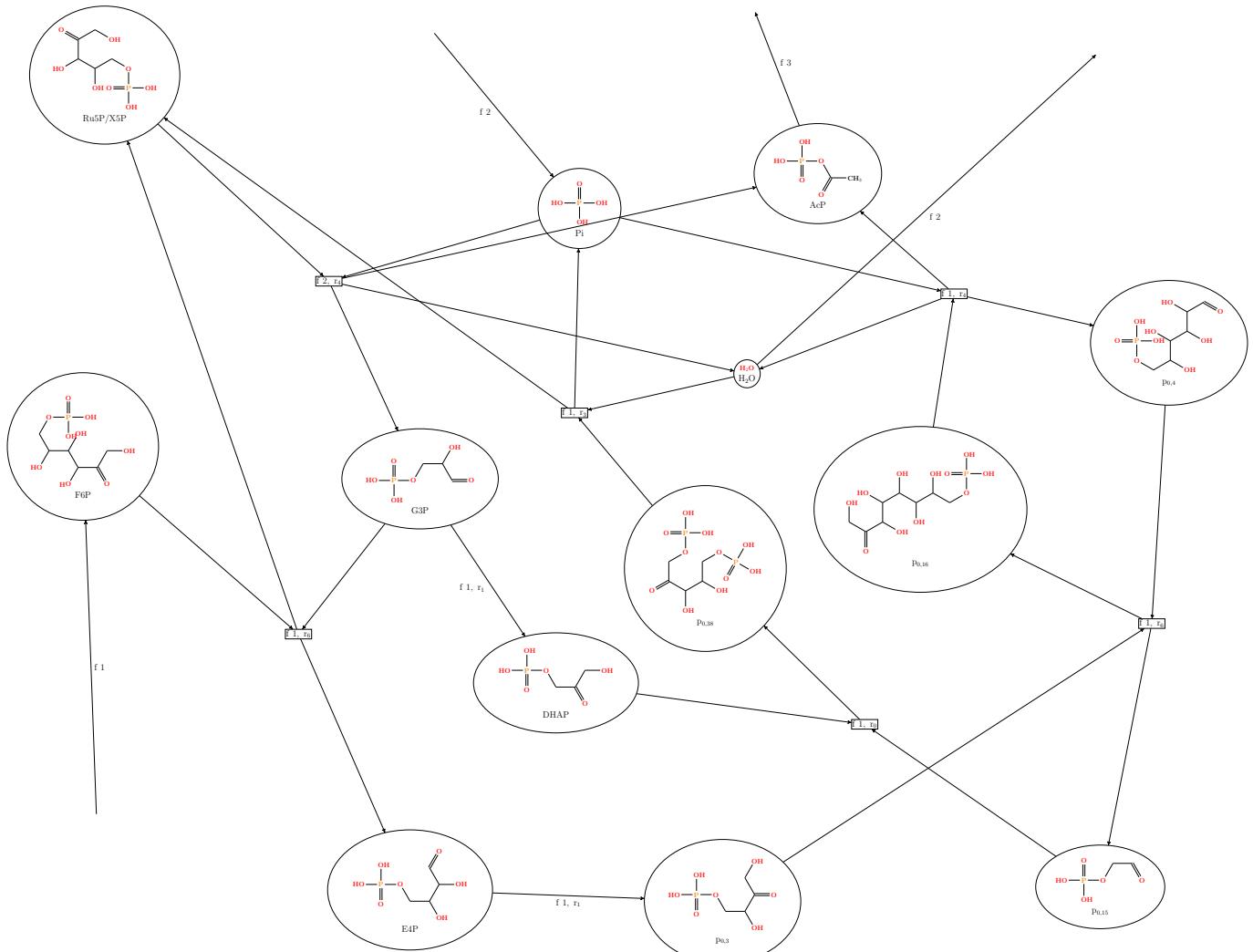
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/439\_dg\_0\_11100\_f\_0\_44\_filt

$$|E| = 8 \quad |P| = 9$$

## 0.17.16 Solution 45

### Overall Data

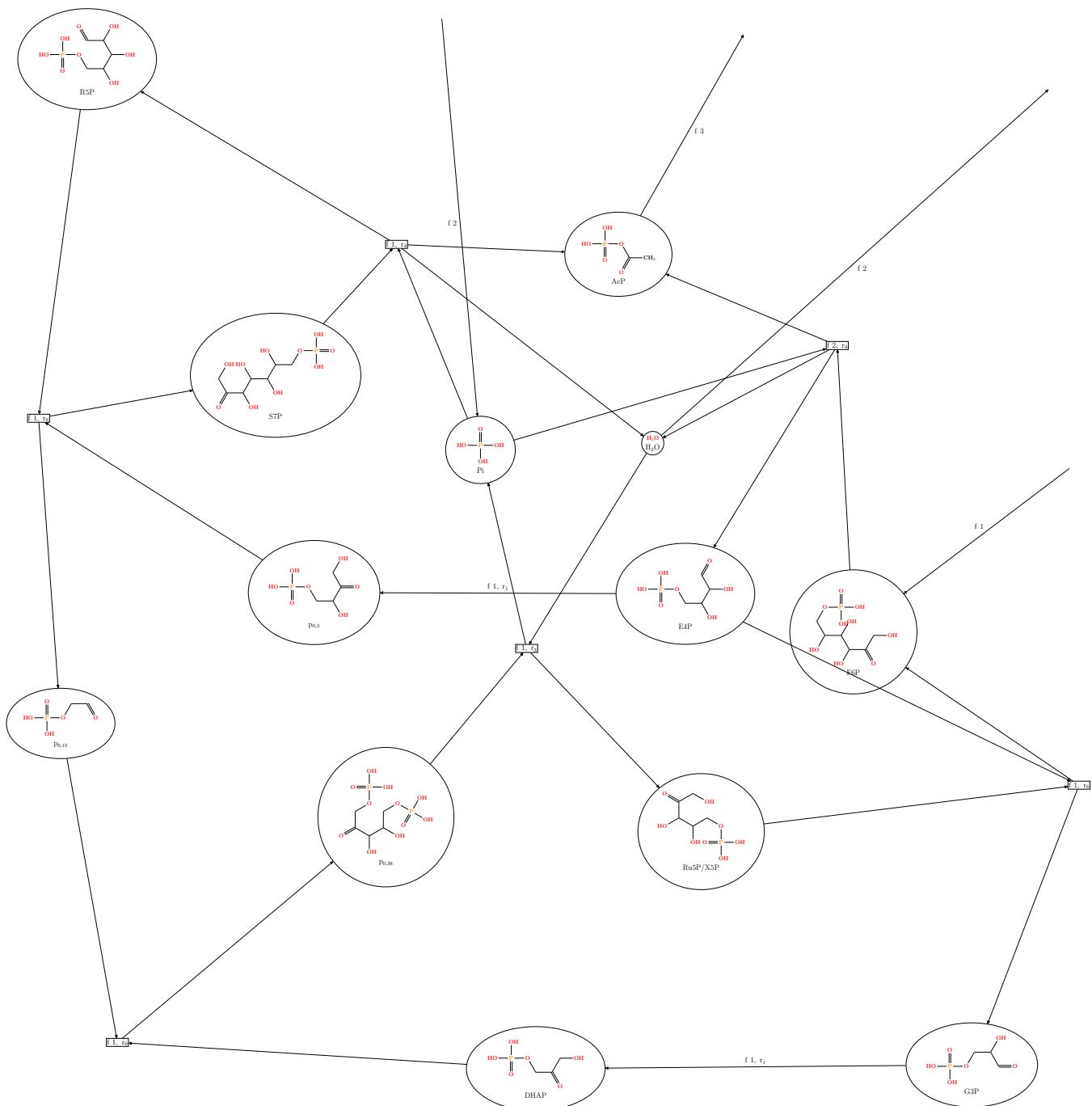
Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
-----	---	---

F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/444\_dg\_0\_11100\_f\_0\_45\_filt

$$|E| = 8 \quad |P| = 9$$

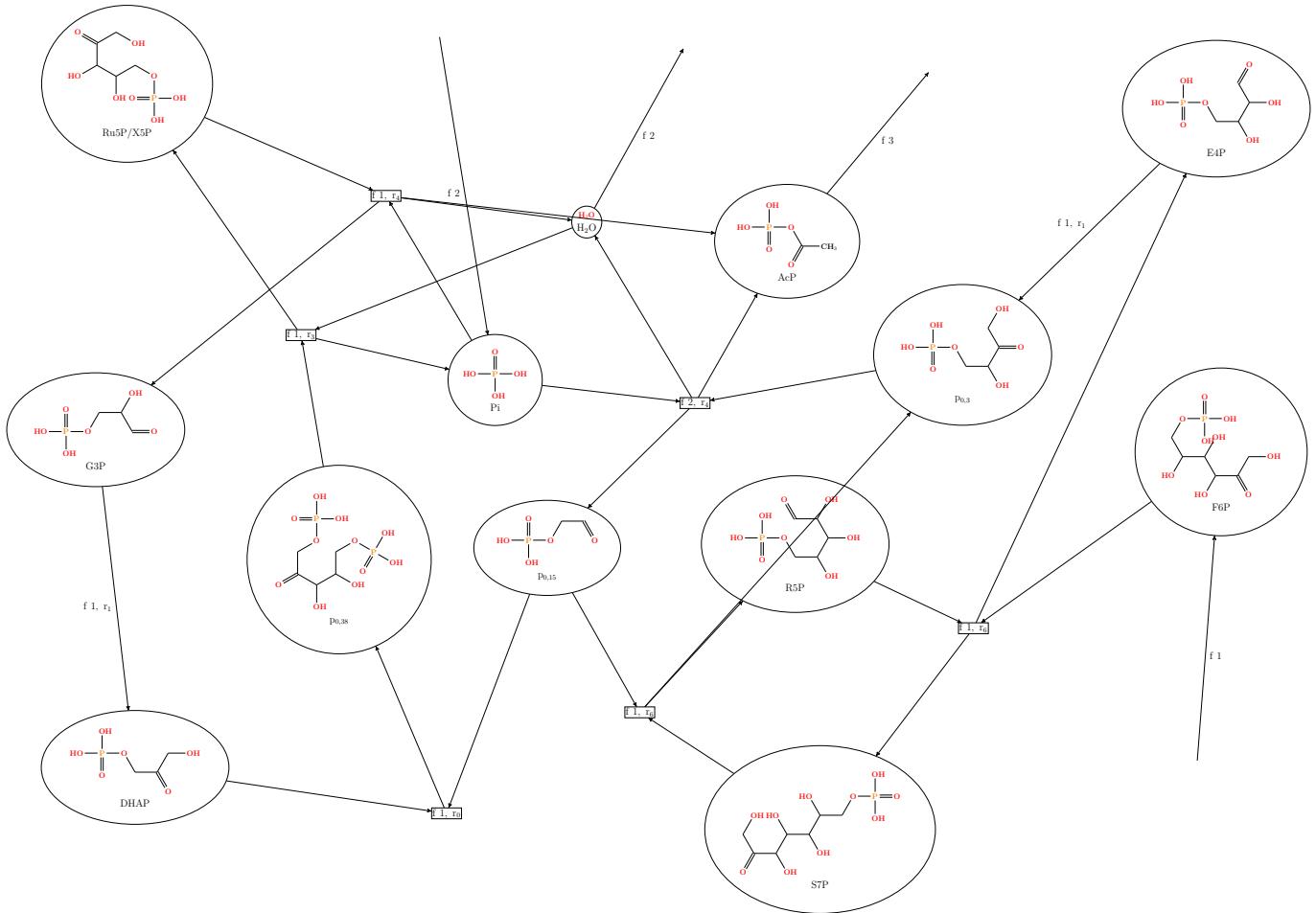
### 0.17.17 Solution 48

#### Overall Data

Objective value (integral): 9

Vertex/Graph	In	Out
AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/449\_dg\_0\_11100\_f\_0\_48\_filt

$$|E| = 8 \quad |P| = 9$$

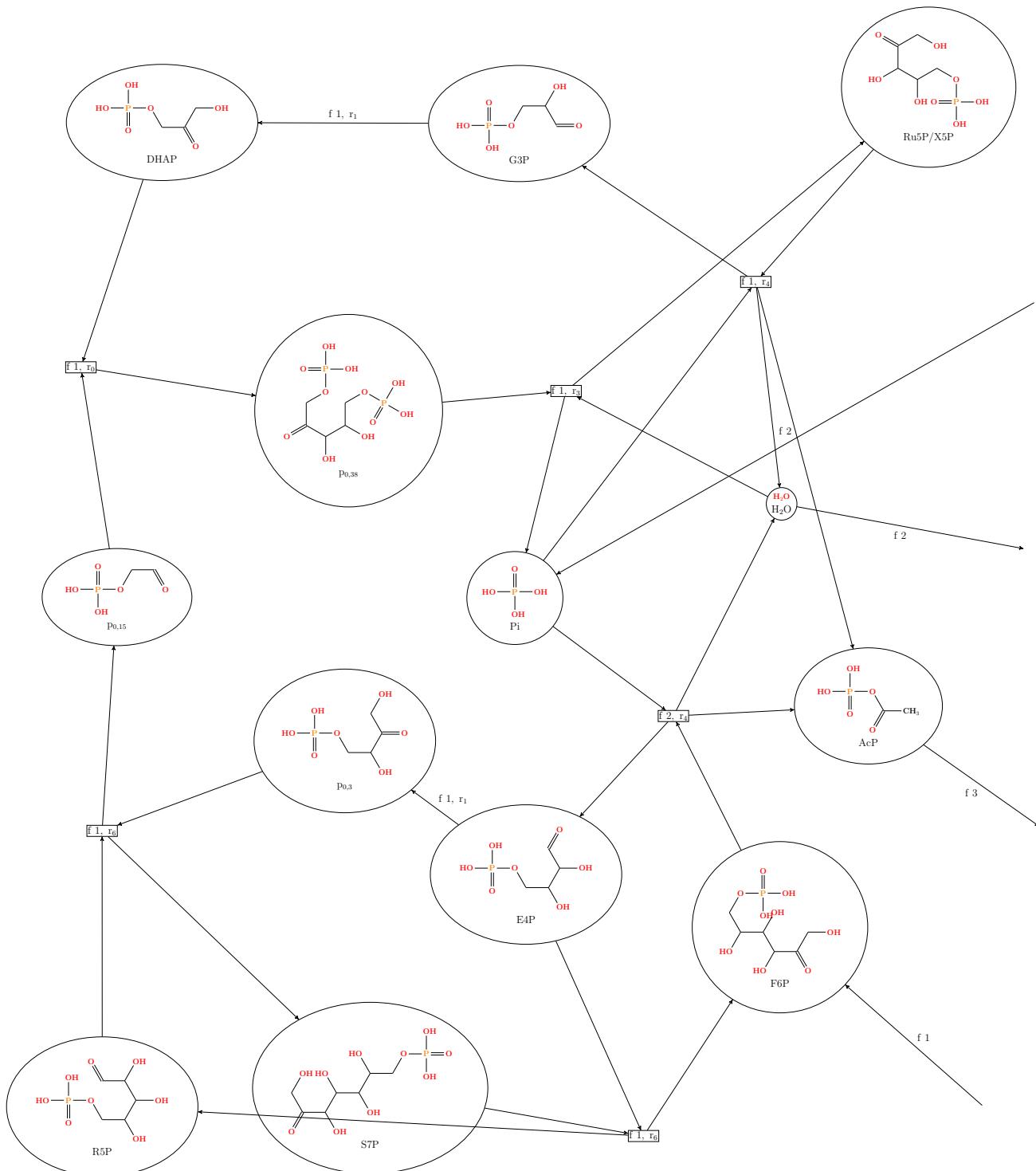
### 0.17.18 Solution 49

#### Overall Data

Objective value (integral): 9

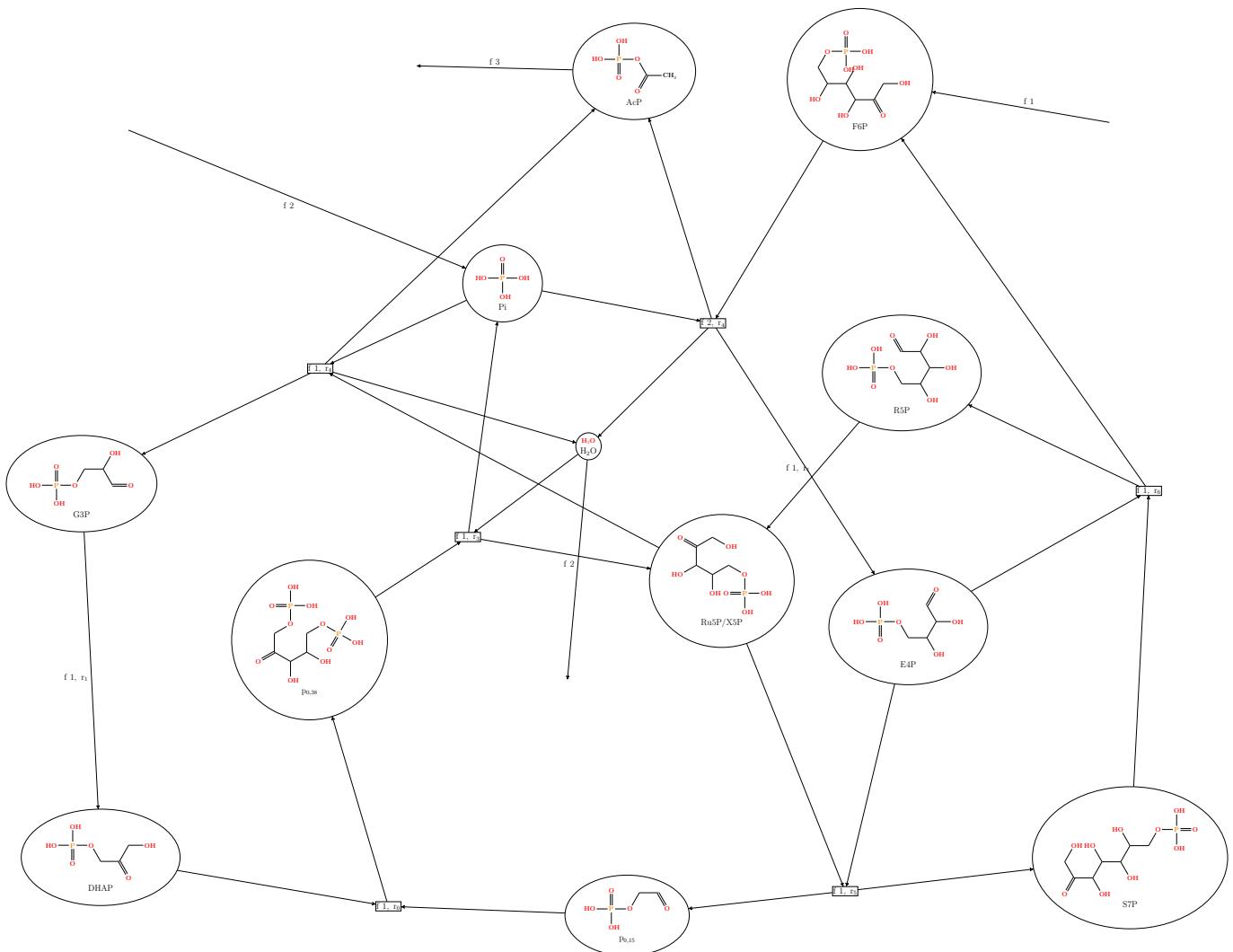
Vertex/Graph	In	Out
AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/459\_dg\_0\_11100\_f\_0\_54\_filt

$$|E| = 8 \quad |P| = 9$$

## 0.17.20 Solution 55

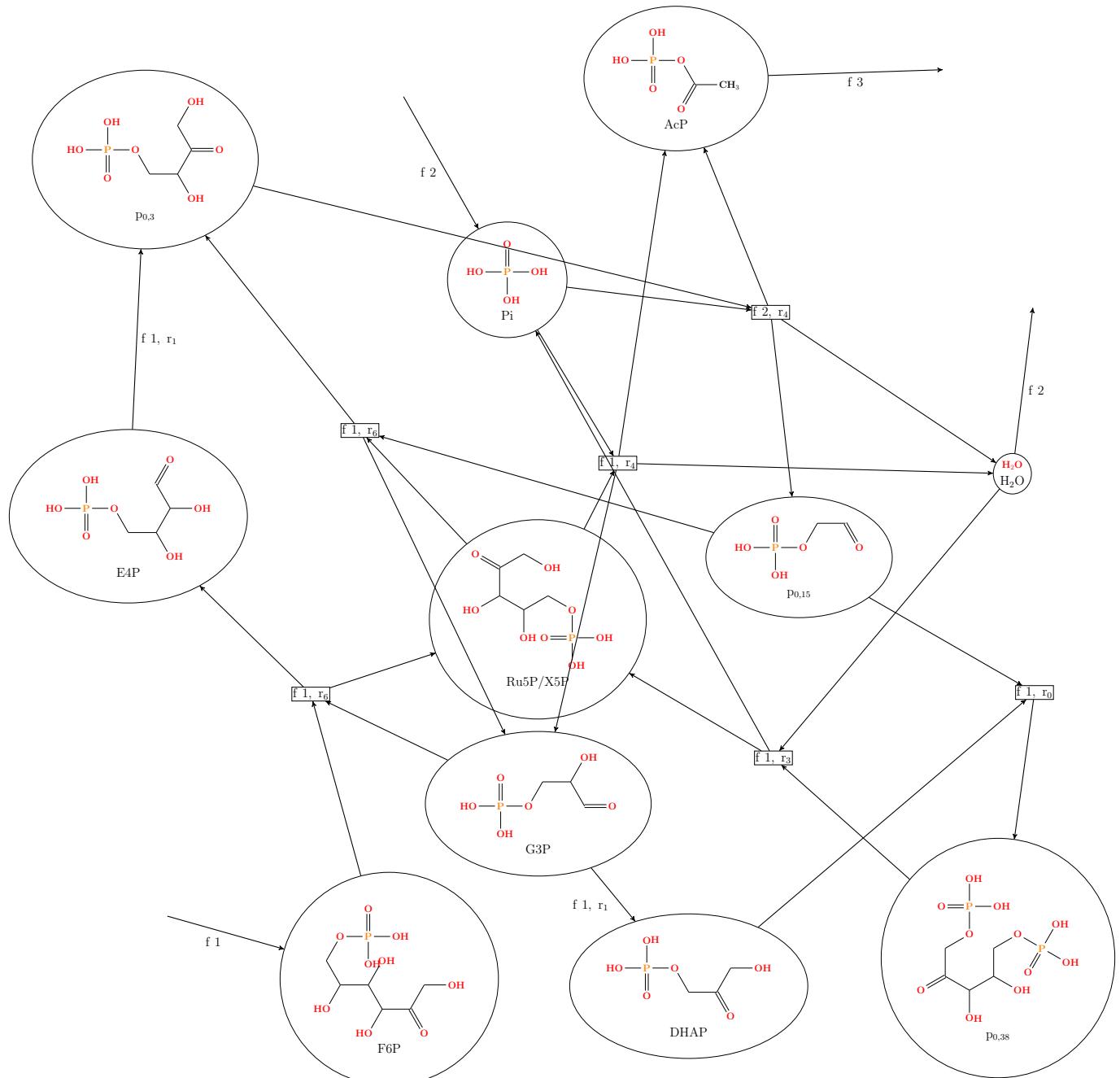
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



$$|F| = 8 \quad |P| = 9$$

0 17 21 Solution 56

## Overall Data

Objective value (integral): 9

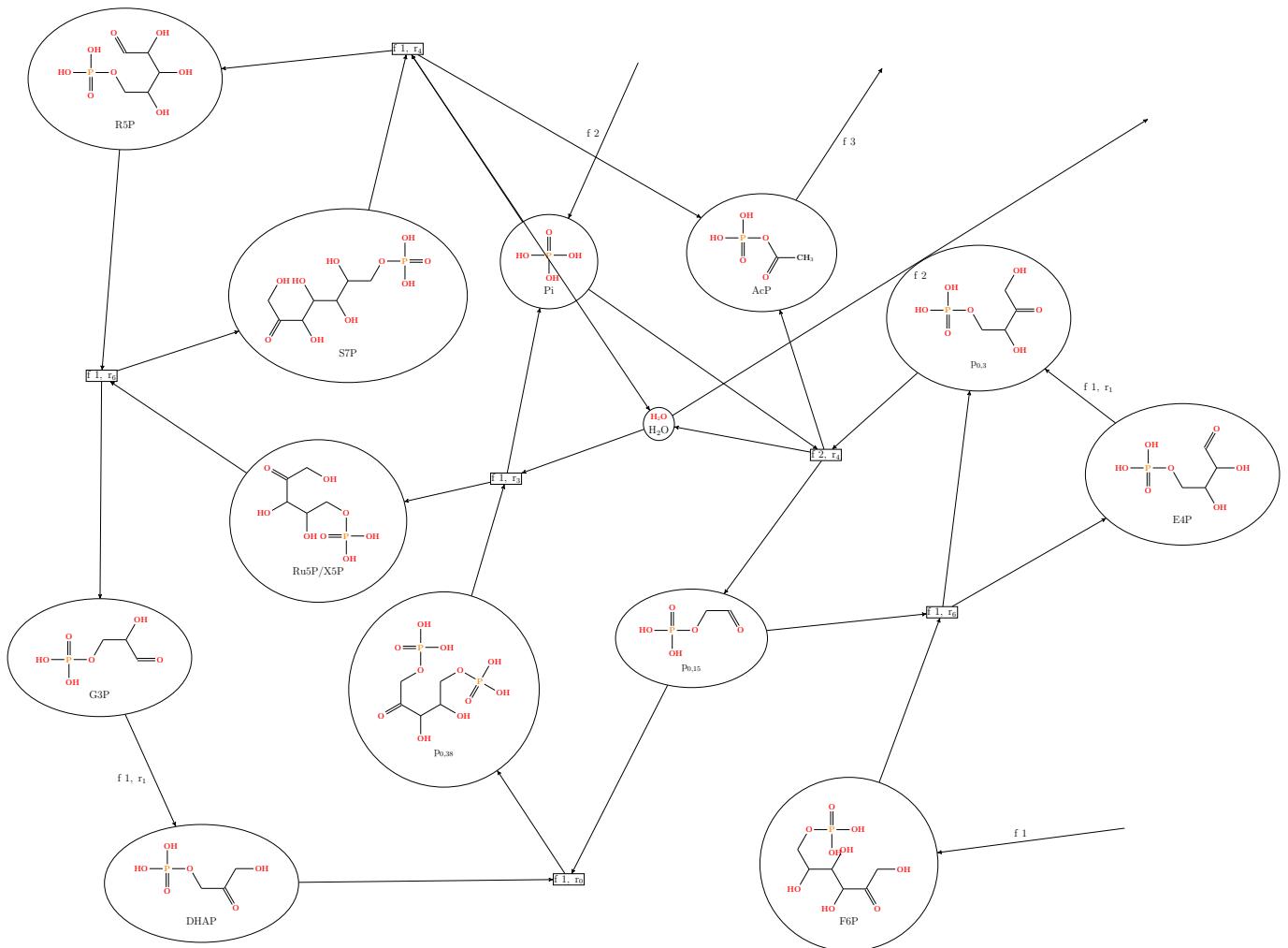
objective value (in  
Vertex/Graph In Out

vertex/graph in  $\cup$

ACI 0 3  
E6P 1 0

F&P 1 0  
H 20 0 3

## Filtered Graph



File: out/469\_dg\_0\_11100\_f\_0\_56\_filt

$$|E| = 8 \quad |P| = 9$$

0.17.22 Solution 59

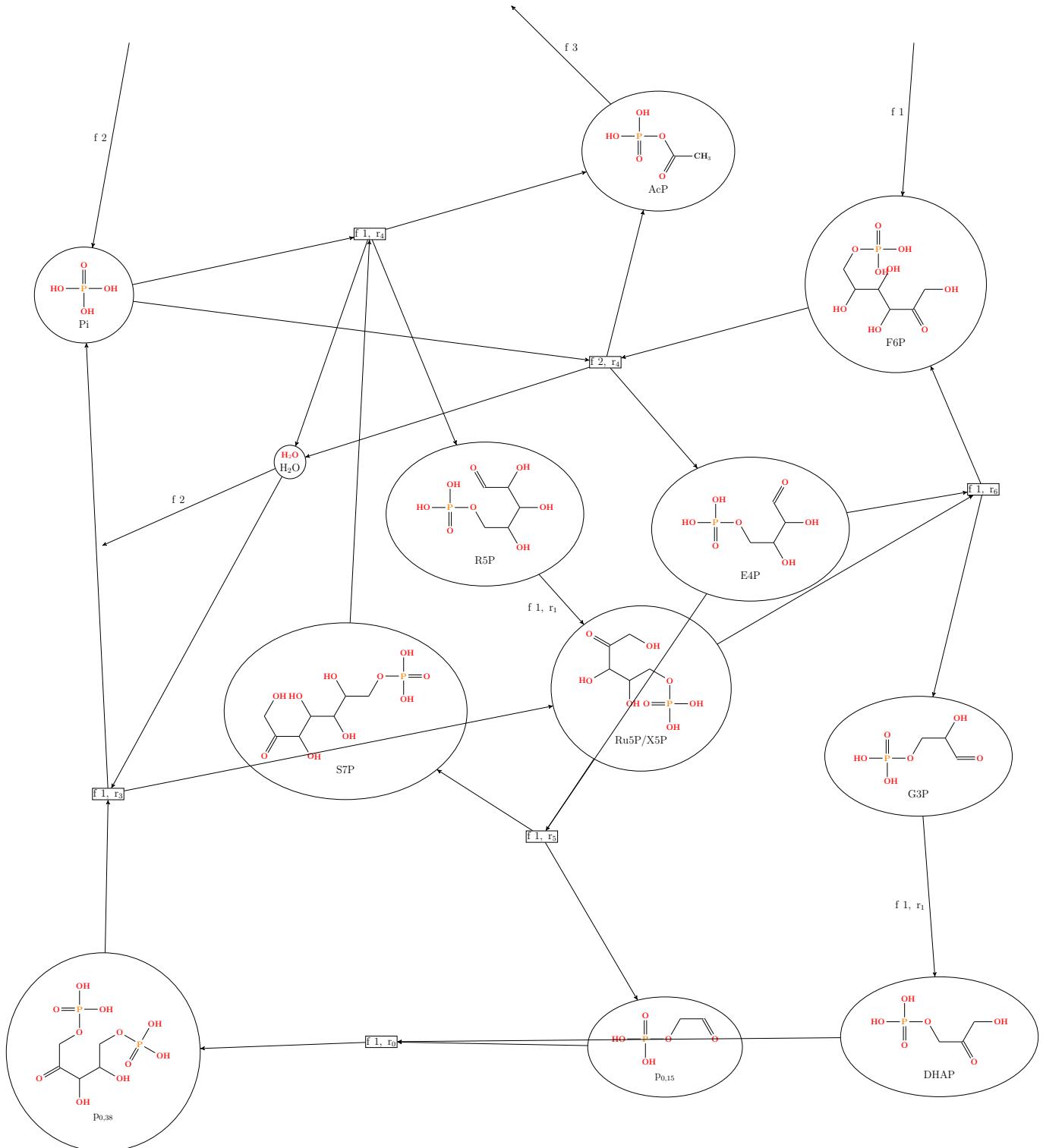
## Overall Data

Objective value (integral): 9

## Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/474\_dg\_0\_11100\_f\_0\_59\_filt

$$|E| = 8 \quad |P| = 9$$

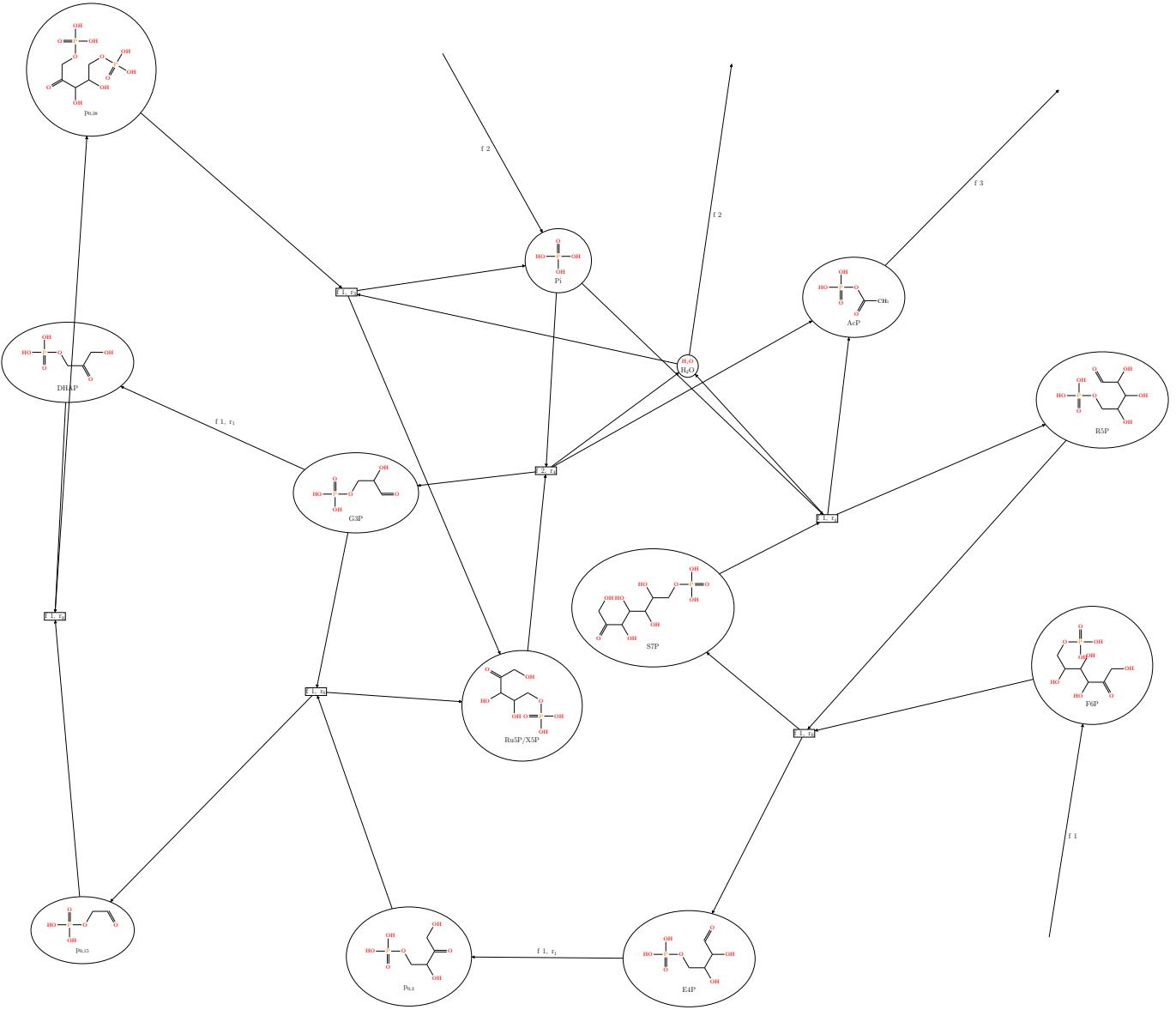
### 0.17.23 Solution 61

#### Overall Data

Objective value (integral): 9

Vertex/Graph	In	Out
AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



$$|E|=2, |D|=2$$

0.17.24 - Solution 62

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Observation values (intervals): 0

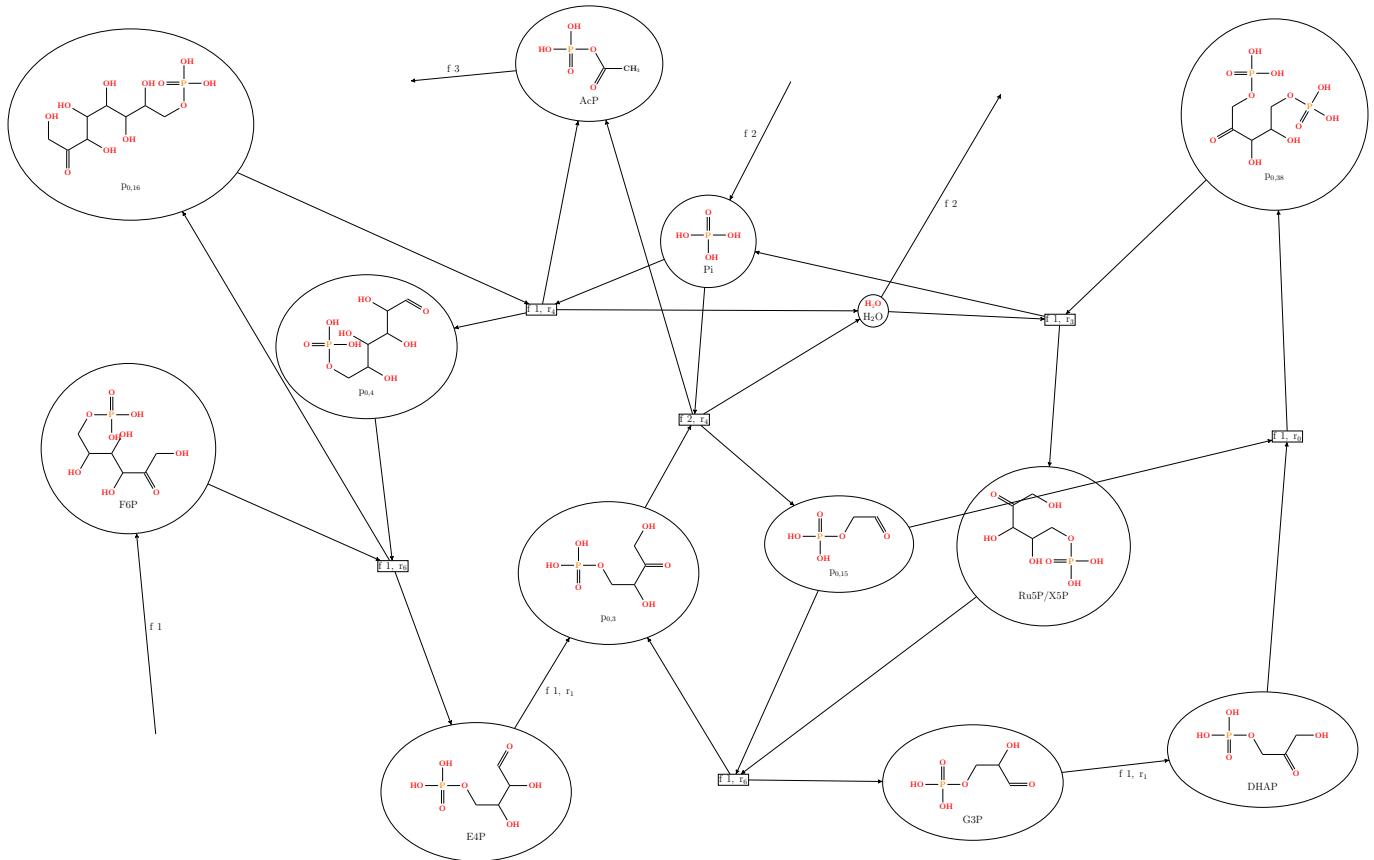
Objective value (in)  
Youtou/Quark In Out

## Vertex/Graph In Unit

AcP 0 3  
ECD 1 0

F6P 1 0  
H 22 0 0

## Filtered Graph



File: out/484\_dg\_0\_11100\_f\_0\_62\_filt

$$|E| = 8 \quad |P| = 9$$

## 0.17.25 Solution 63

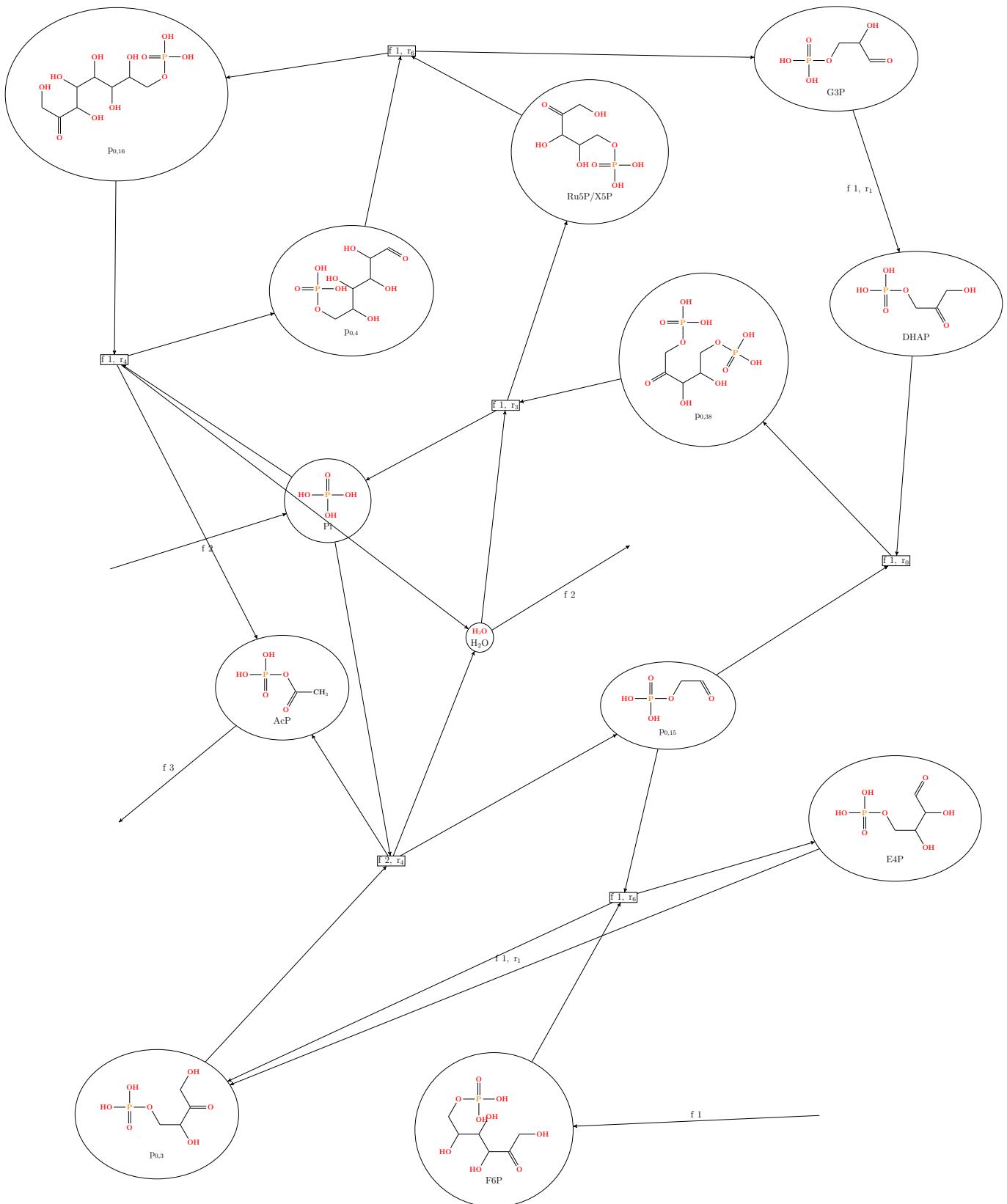
## Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/489\_dg\_0\_11100\_f\_0\_63\_filt

$|E| = 8$   $|P| = 9$

## 0.17.26 Solution 64

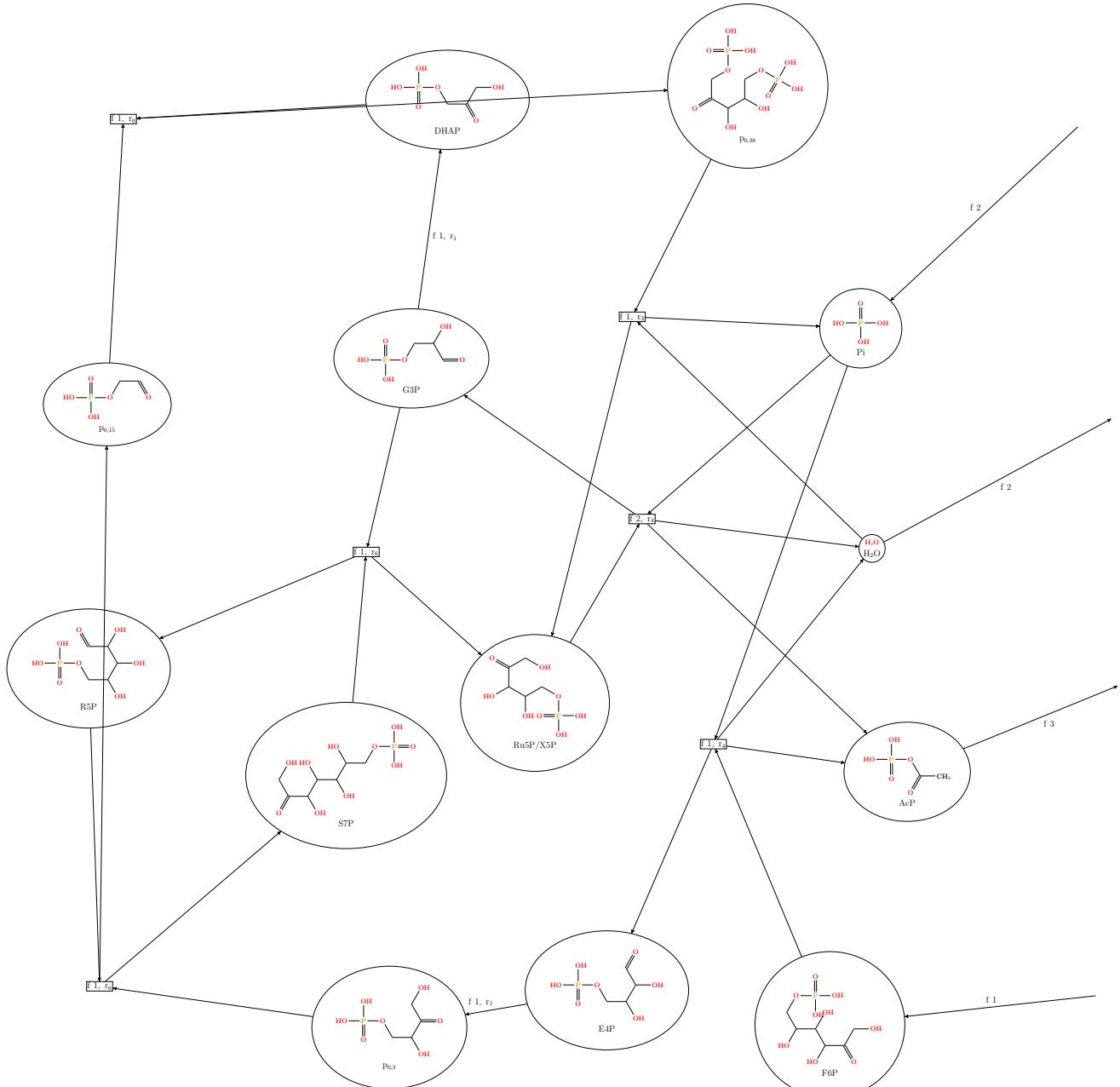
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/494\_dg\_0\_11100\_f\_0\_64\_filt

$$|E| = 8 \quad |P| = 9$$

## 0.17.27 Solution 70

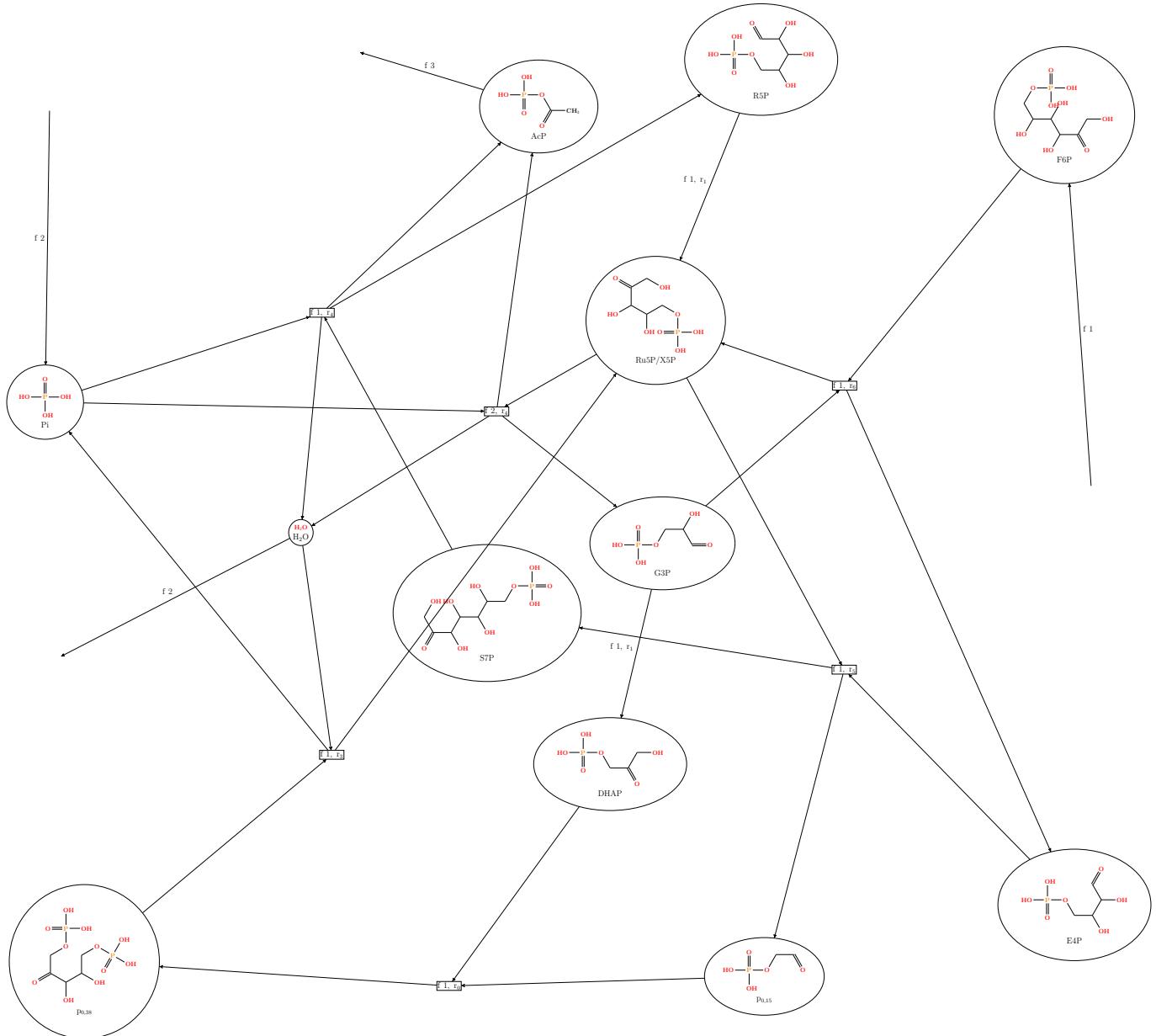
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/499\_dg\_0\_11100\_f\_0\_70\_filt

|E| = 8 |P| = 9

## 0.17.28 Solution 71

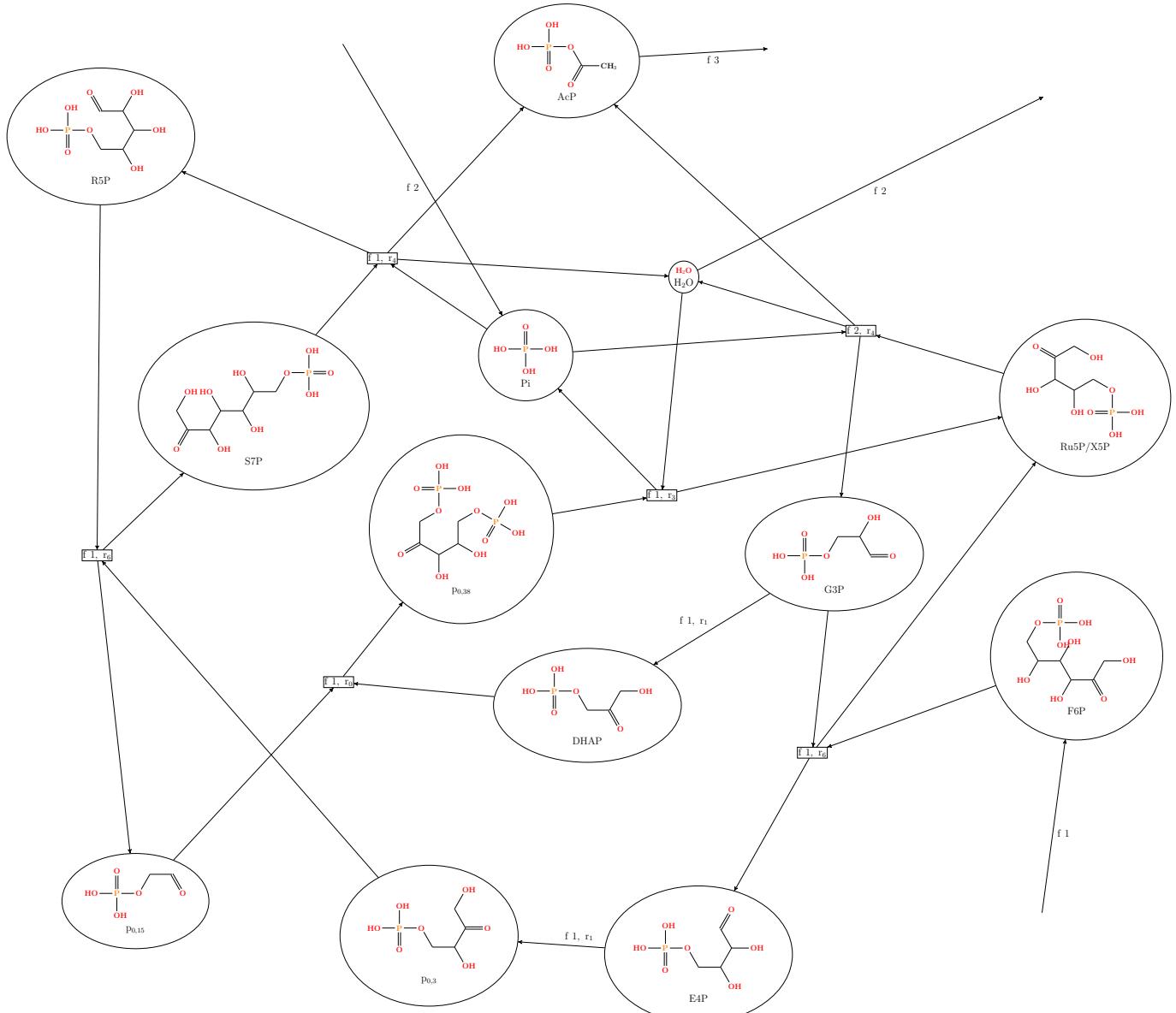
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

### Filtered Graph



File: out/504\_dg\_0\_11100\_f\_0\_71\_filt

|E| = 8 |P| = 9

### 0.17.29 Solution 72

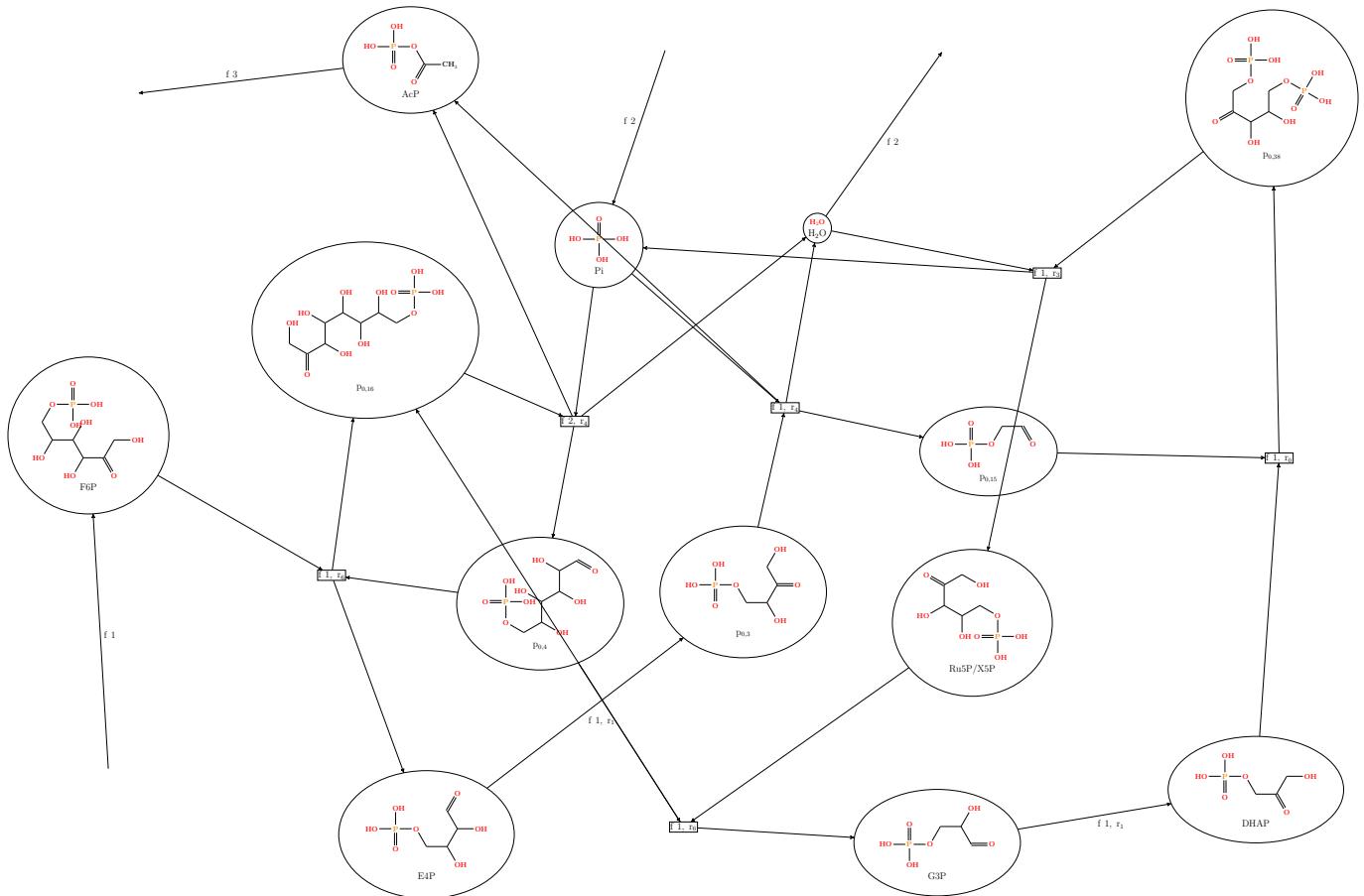
## Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



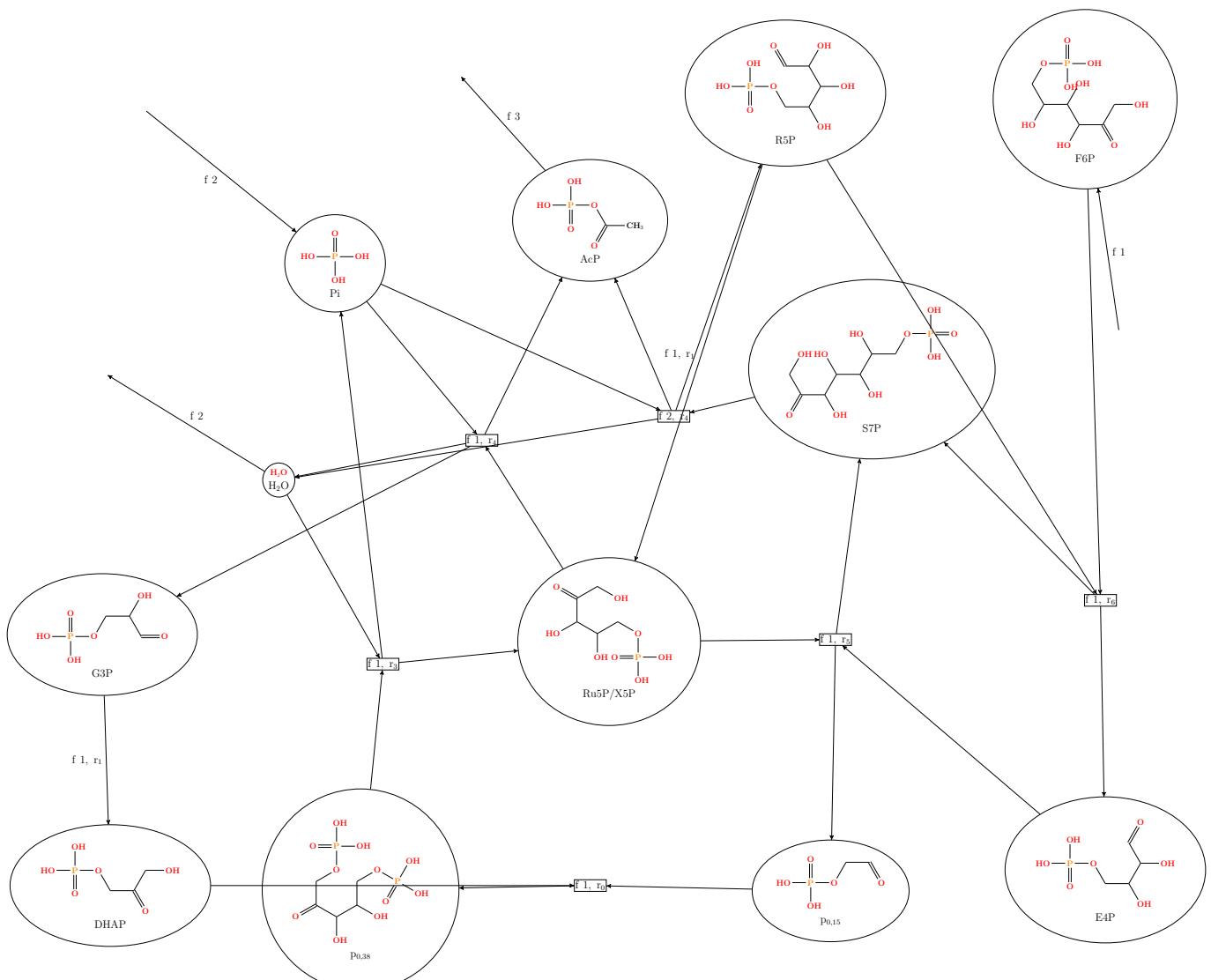
**0.17.30**    **Sc**

## Overall Data

### Objective value (in

Vertex/Graph	In	Out
AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/514\_dg\_0\_11100\_f\_0\_73\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.31 Solution 74

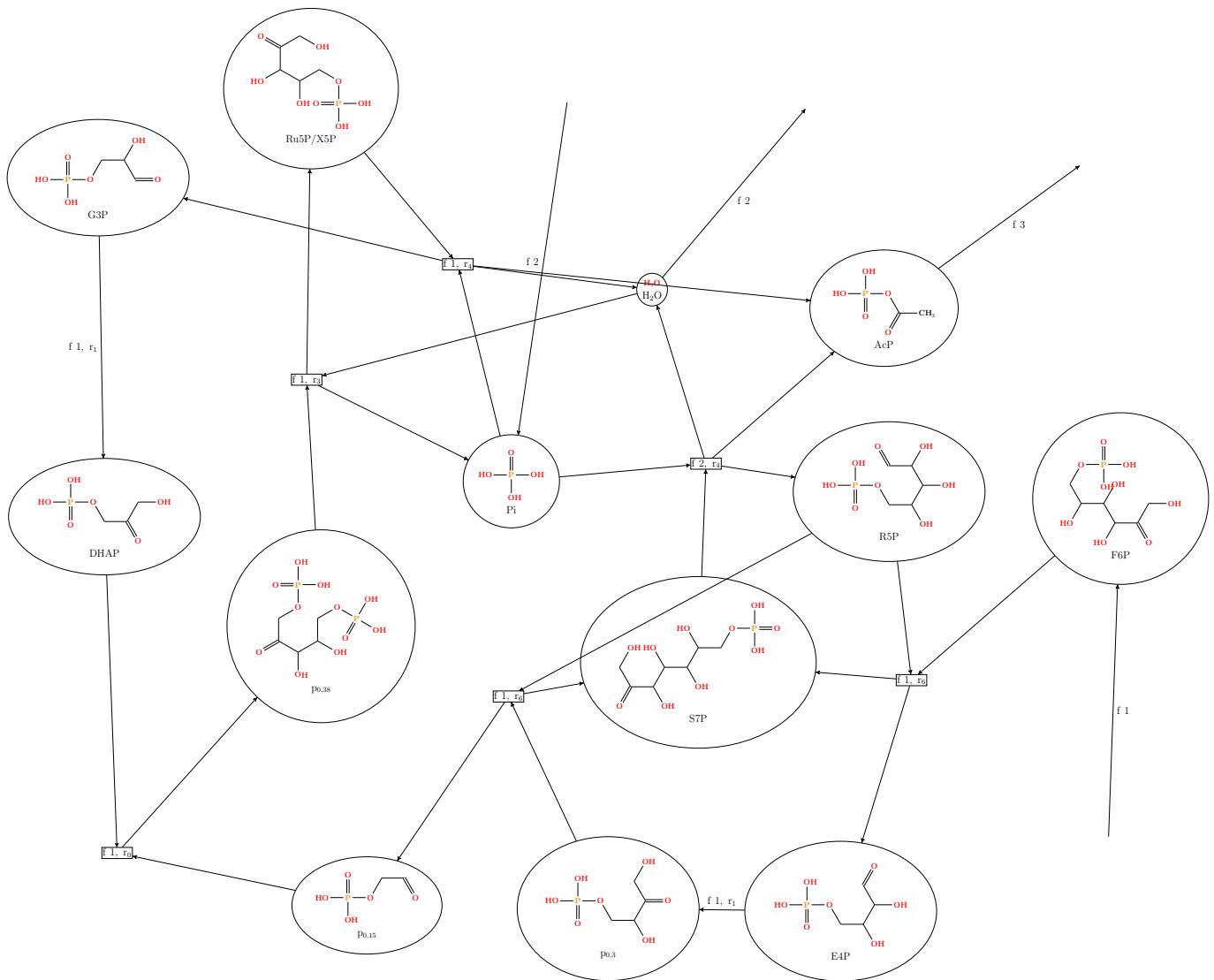
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/519\_dg\_0\_11100\_f\_0\_74\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.32 Solution 75

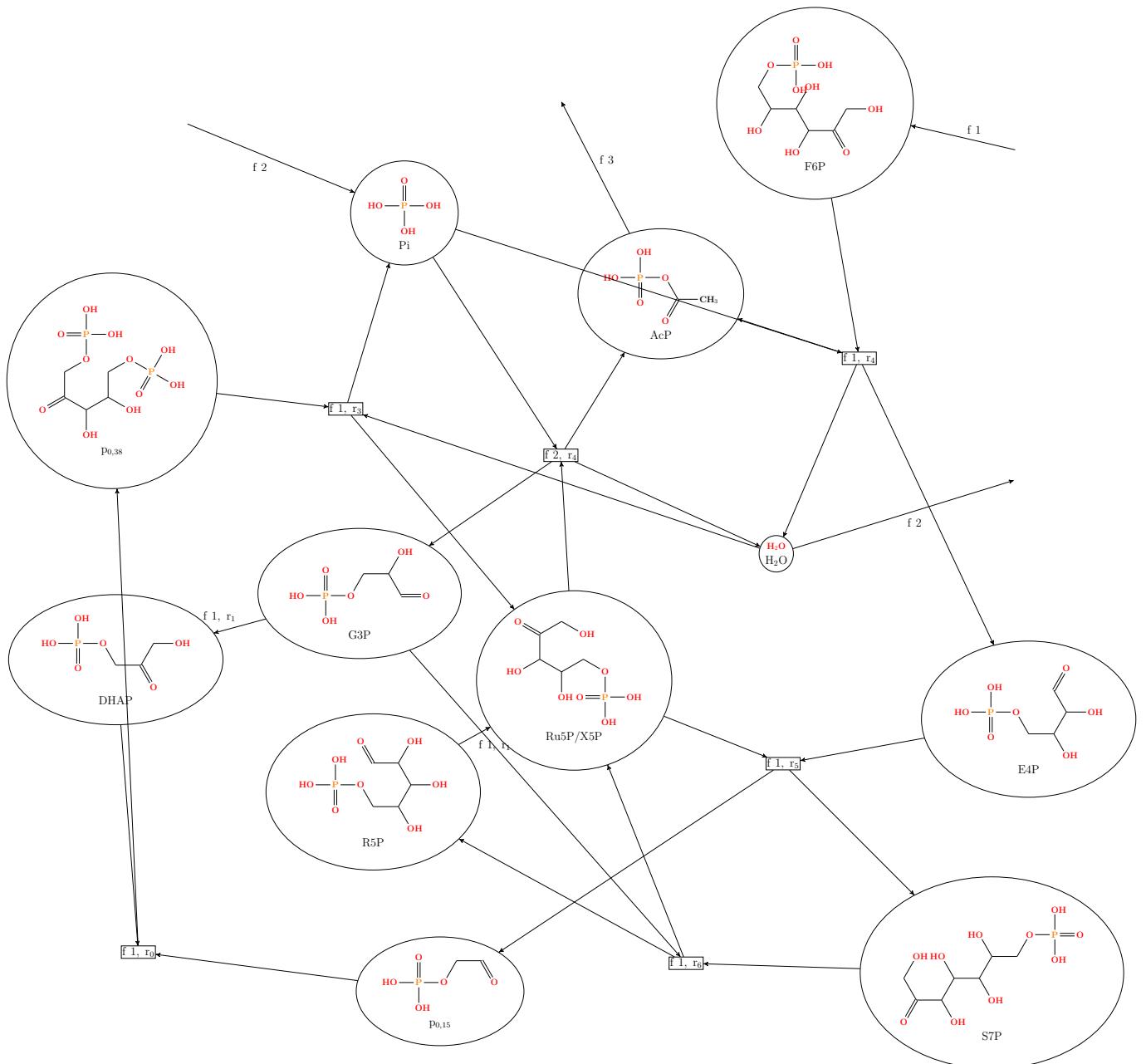
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/524\_dg\_0\_11100\_f\_0\_75\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.33 Solution 76

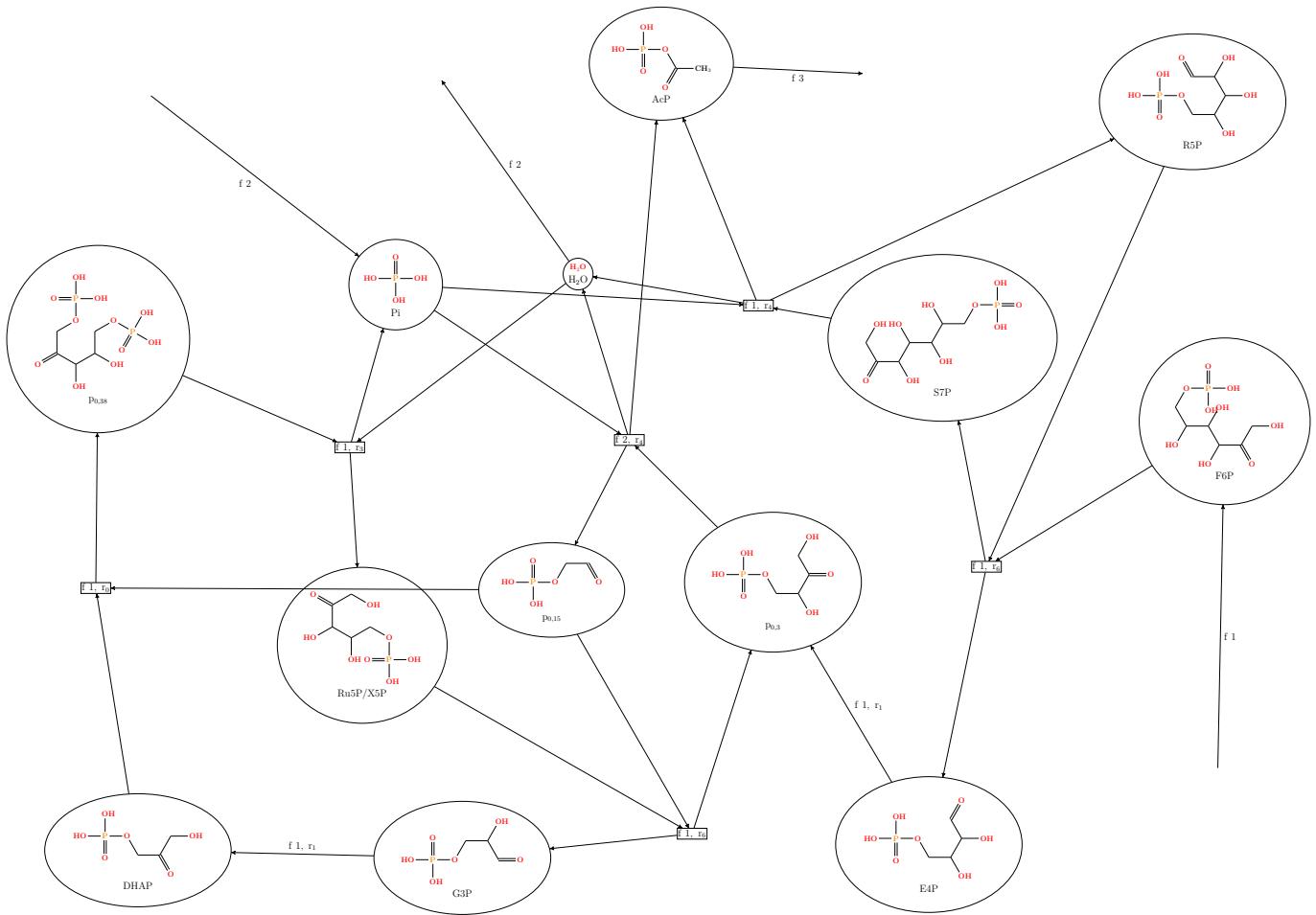
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/529\_dg\_0\_11100\_f\_0\_76\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.34 Solution 78

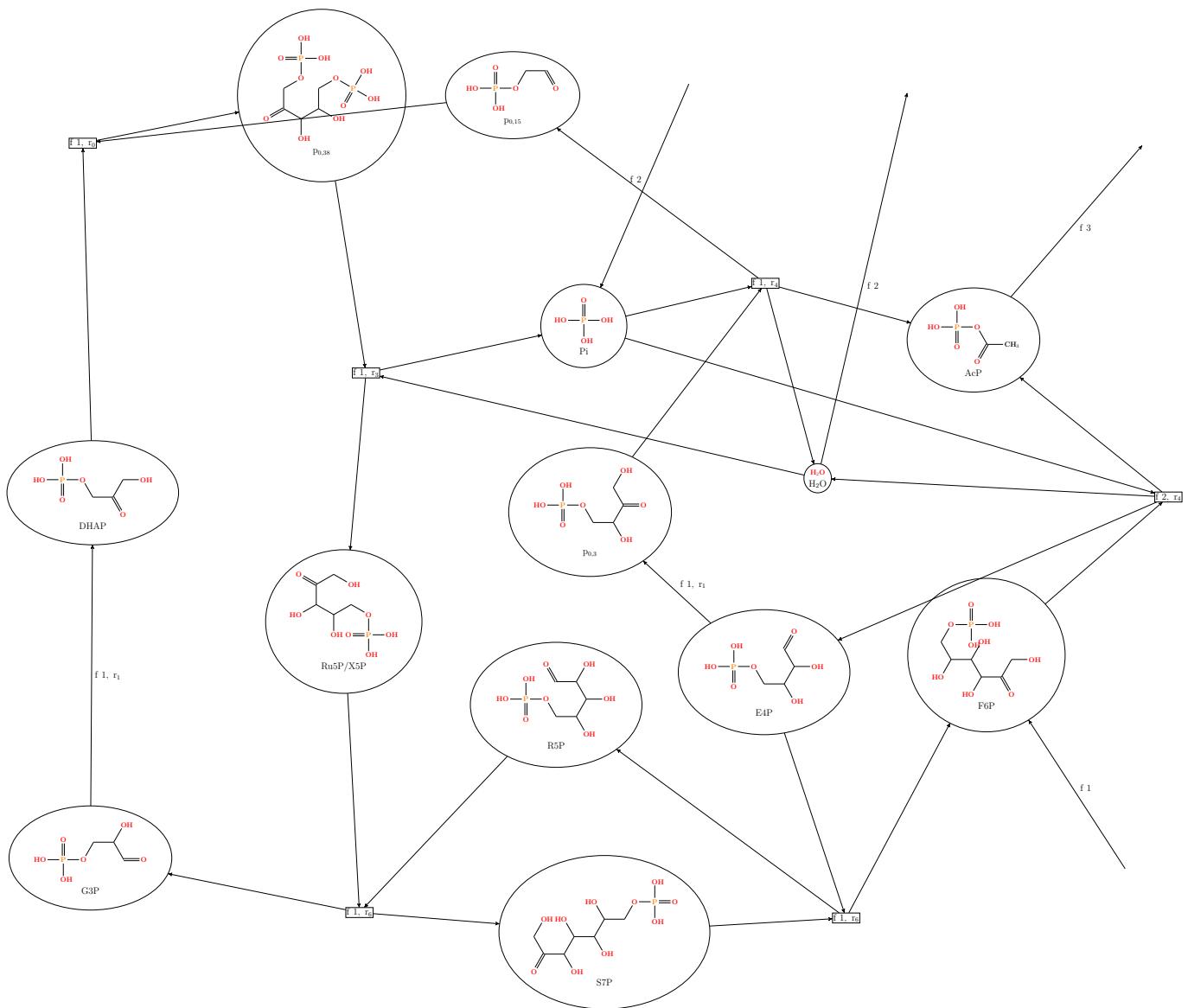
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/534\_dg\_0\_11100\_f\_0\_78\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.35 Solution 79

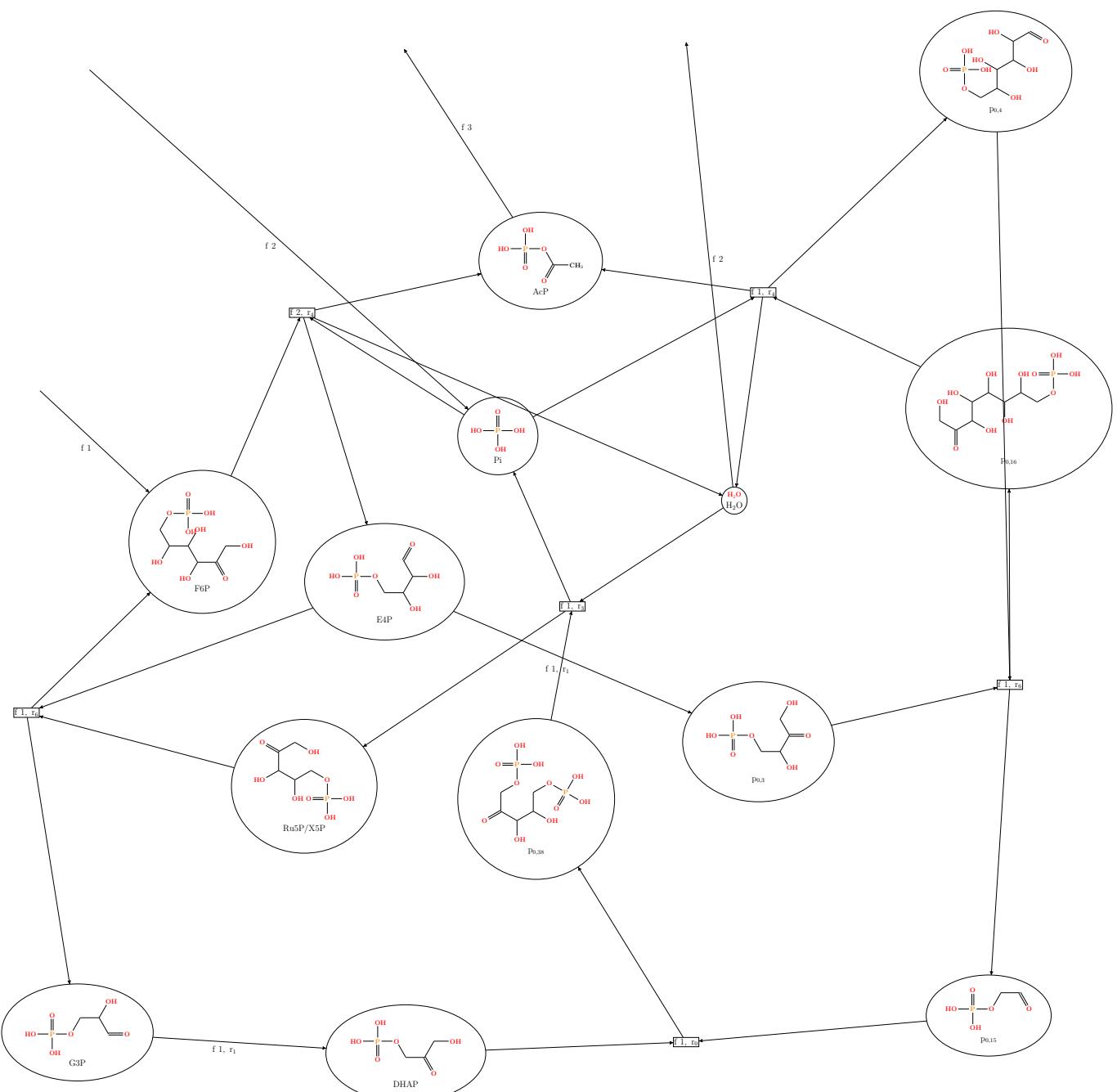
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/539\_dg\_0\_11100\_f\_0\_79\_filt

$$|E| = 8 \quad |P| = 9$$

### 0.17.36 Solution 83

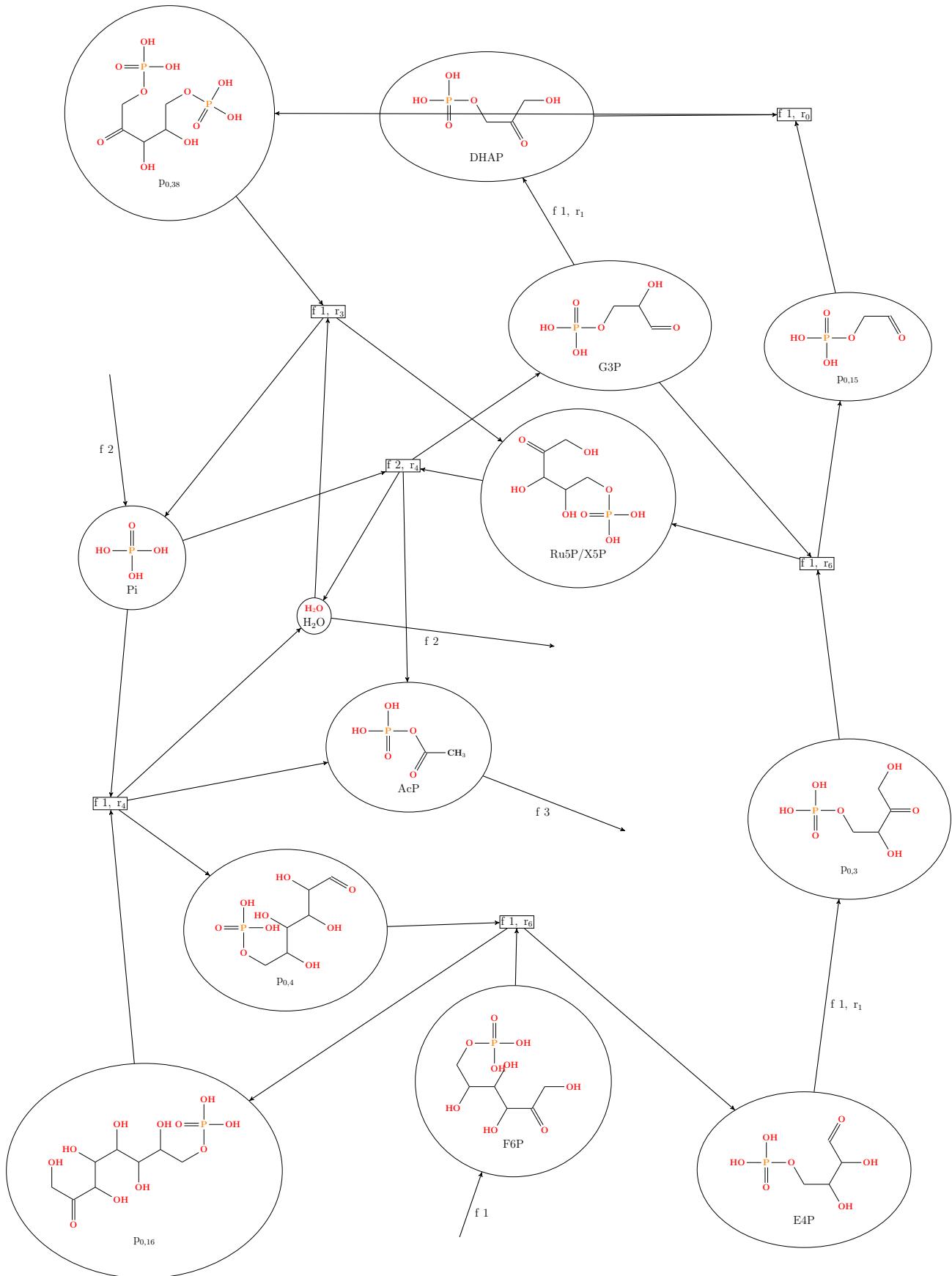
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/544\_dg\_0\_11100\_f\_0\_83\_filt

$|E| = 8 \quad |P| = 9$

### 0.17.37 Solution 84

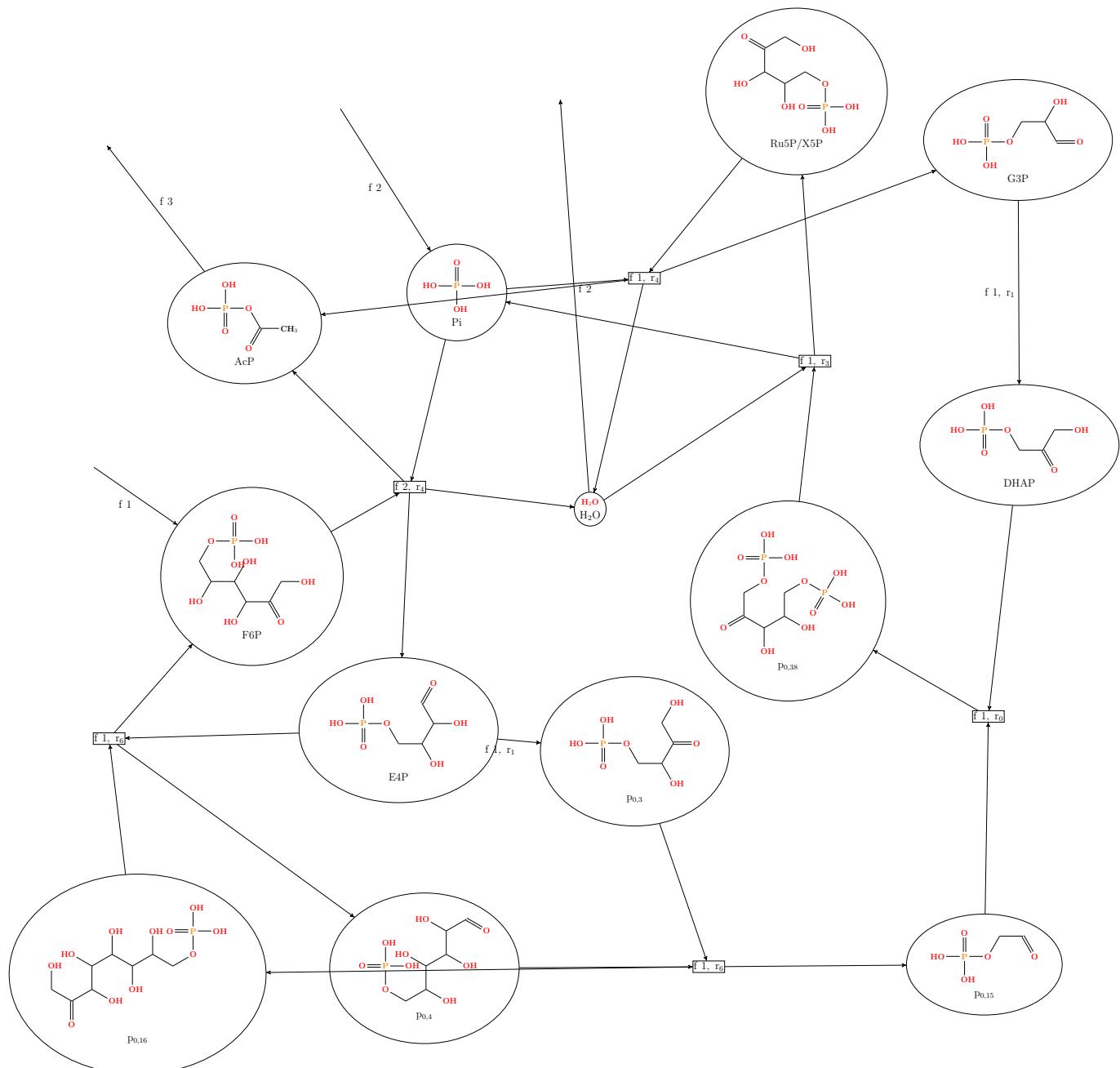
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

#### Filtered Graph



File: out/549\_dg\_0\_11100\_f\_0\_84\_filt

|E| = 8 |P| = 9

### 0.17.38 Solution 89

#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

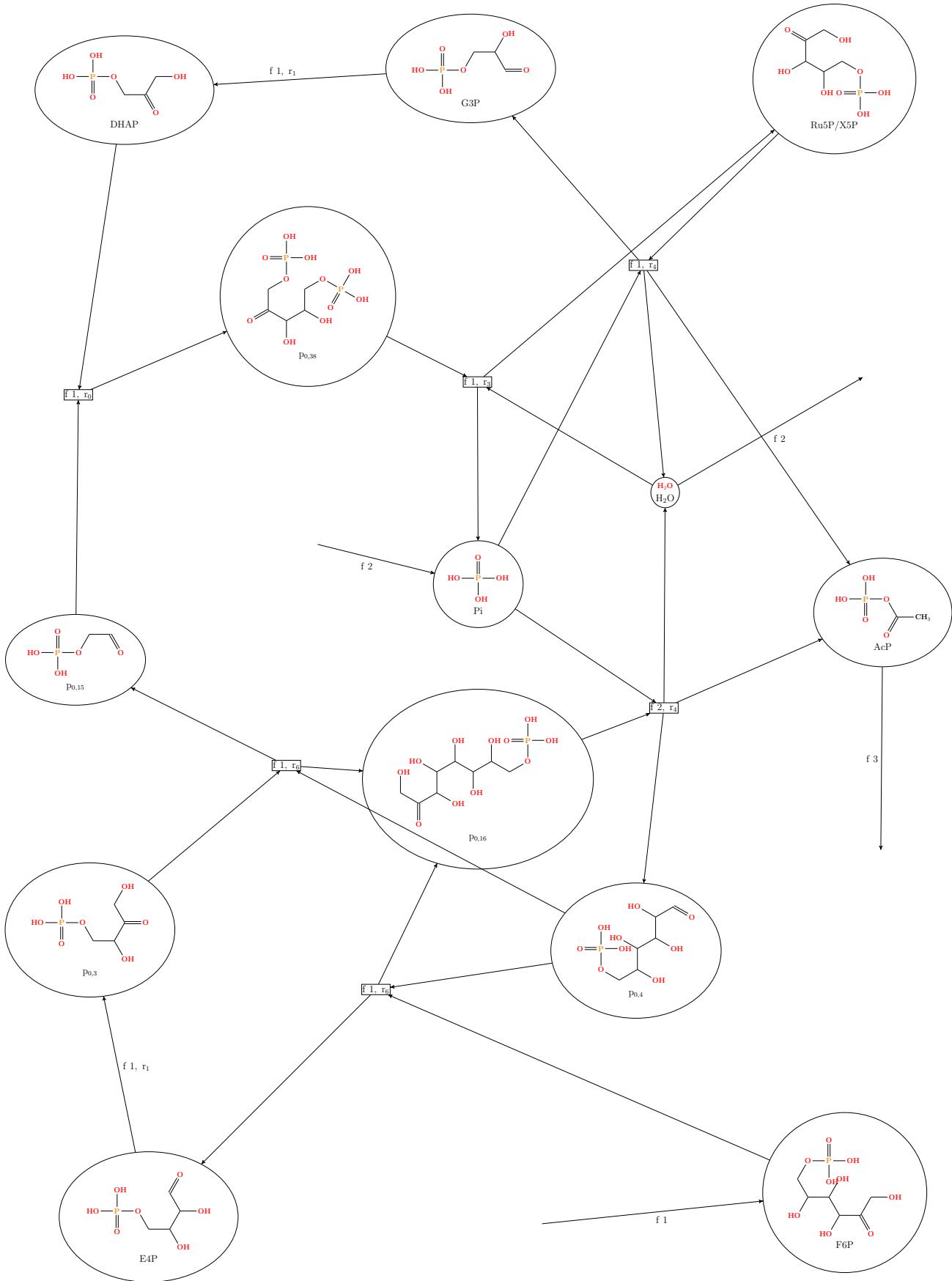
AcP 0 3

F6P 1 0

H\_2O 0 2

Pi 2 0

## Filtered Graph



File: out/554\_dg\_0\_11100\_f\_0\_89\_filt

$|E| = 8 \quad |P| = 9$

### 0.17.39 Solution 90

#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

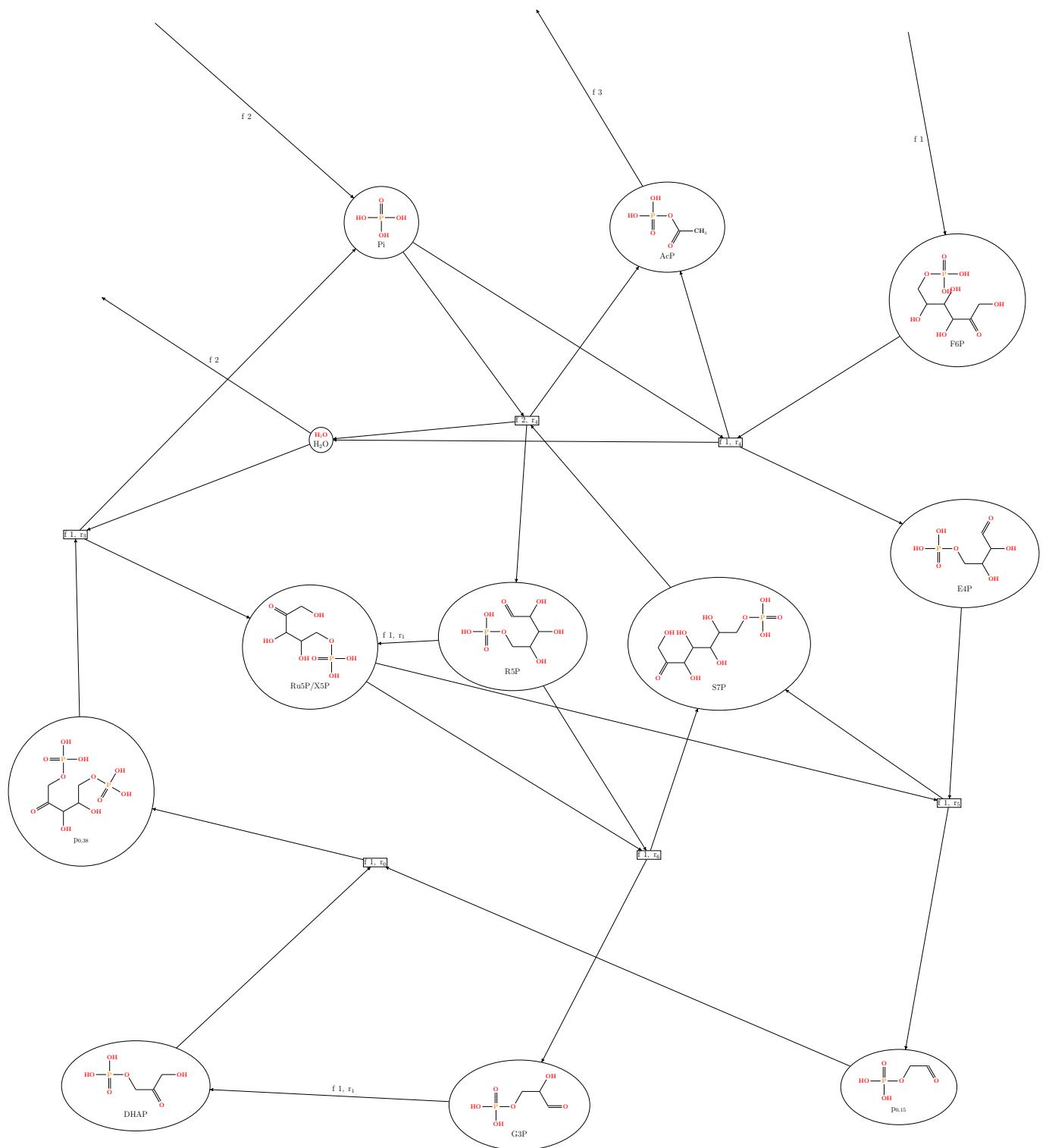
AcP 0 3

F6P 1 0

H\_2O 0 2

Pi 2 0

## Filtered Graph



File: out/559\_dg\_0\_11100\_f\_0\_90\_filt

$$|E| = 8 \quad |P| = 9$$

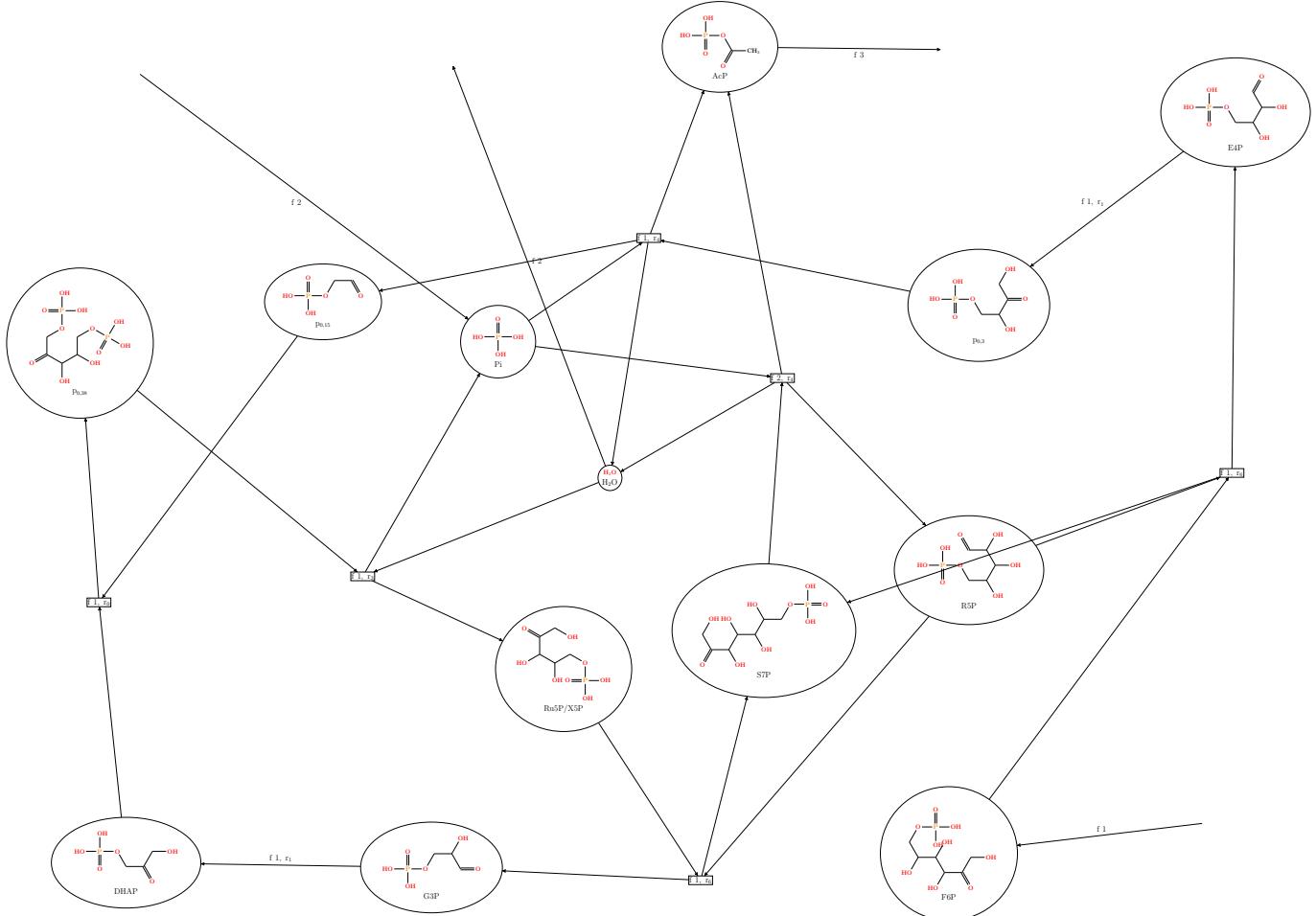
### 0.17.40 Solution 91

#### Overall Data

Objective value (integral): 9

Vertex/Graph	In	Out
AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

### Filtered Graph



File: out/564\_dg\_0\_11100\_f\_0\_91\_filt

$$|E| = 8 \quad |P| = 9$$

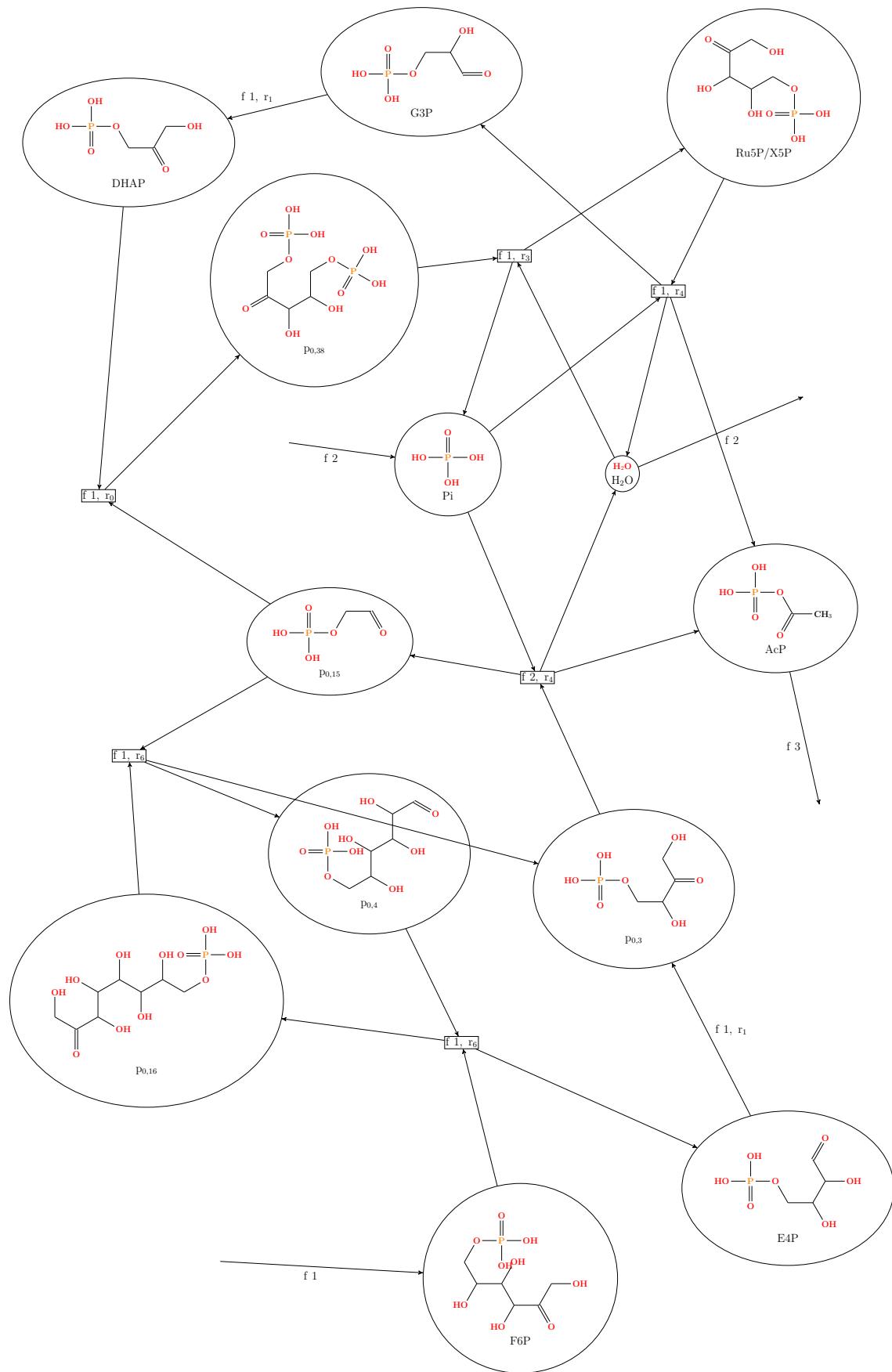
### 0.17.41 Solution 92

#### Overall Data

Objective value (integral): 9

Vertex/Graph	In	Out
AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/569\_dg\_0\_11100\_f\_0\_92\_filt

$$|E| = 8 \quad |P| = 9$$

## 0.17.42 Solution 93

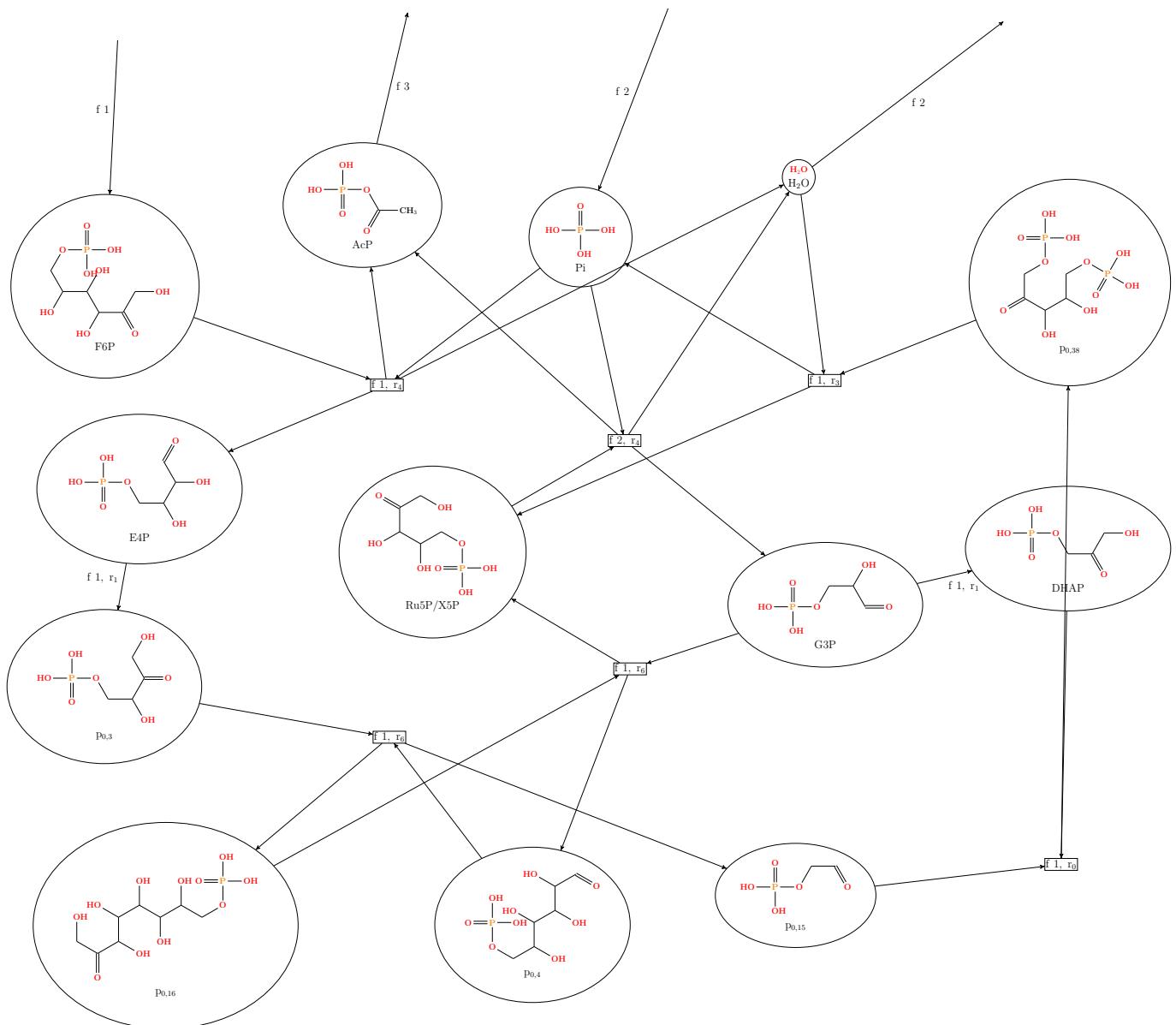
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/574\_dg\_0\_11100\_f\_0\_93\_filt

|E| = 8 |P| = 9

## 0.18 Enumerated Flows with 9 unique reactions

### 0.18.1 Solution 18

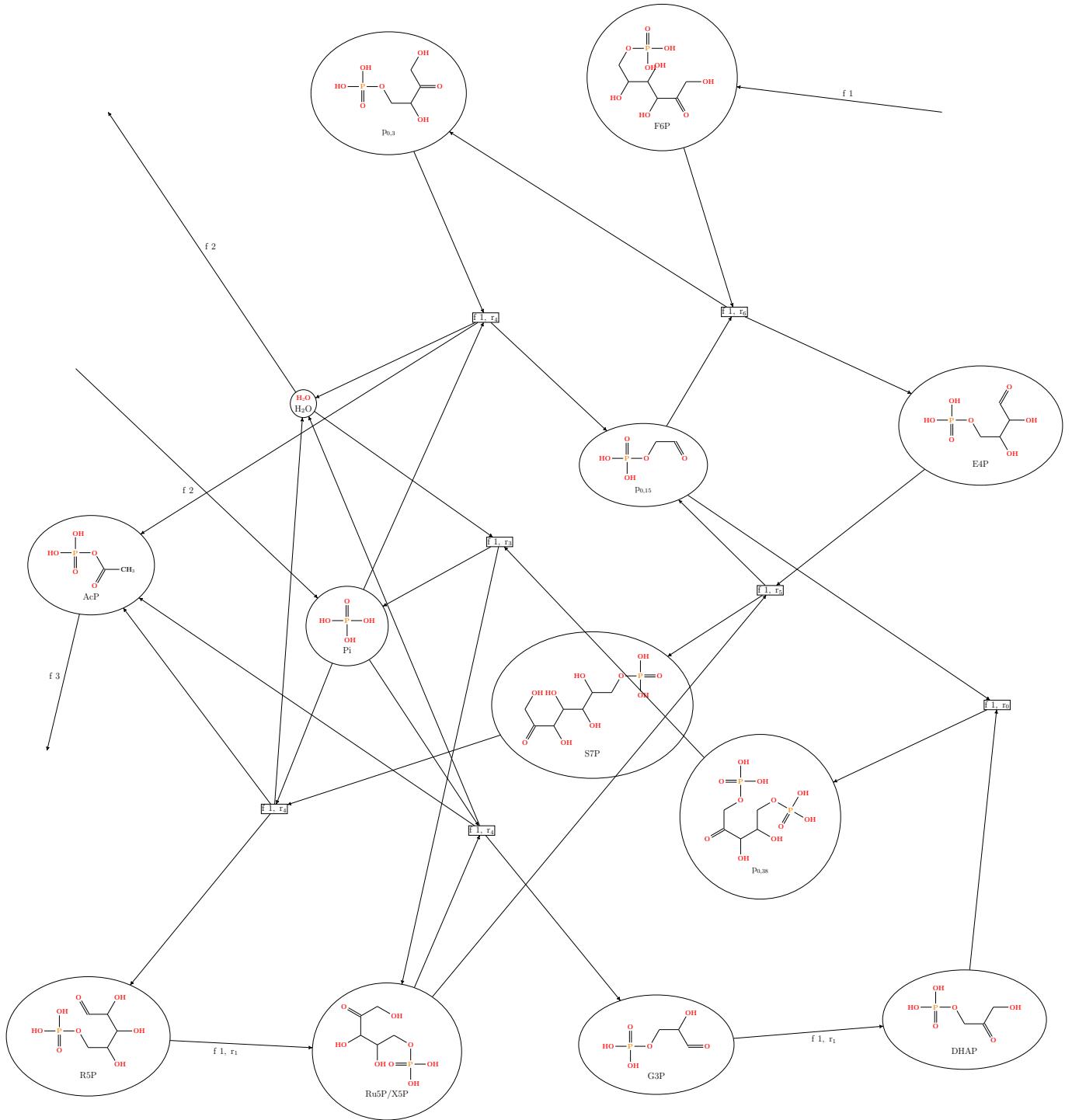
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/579\_dg\_0\_11100\_f\_0\_18\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.2 Solution 19

### Overall Data

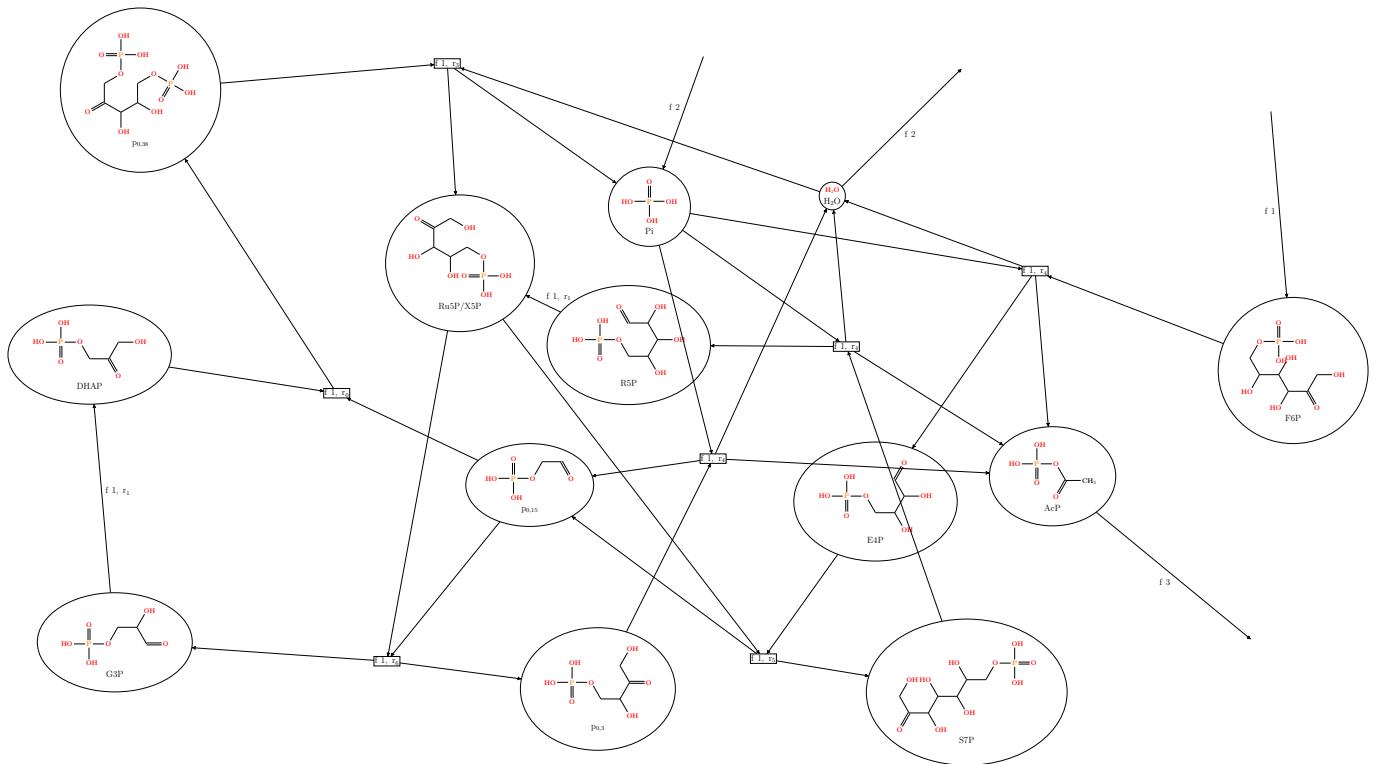
Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0

H_20	0	2
Pi	2	0

### Filtered Graph



File: out/584\_dg\_0\_11100\_f\_0\_19\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.3 Solution 21

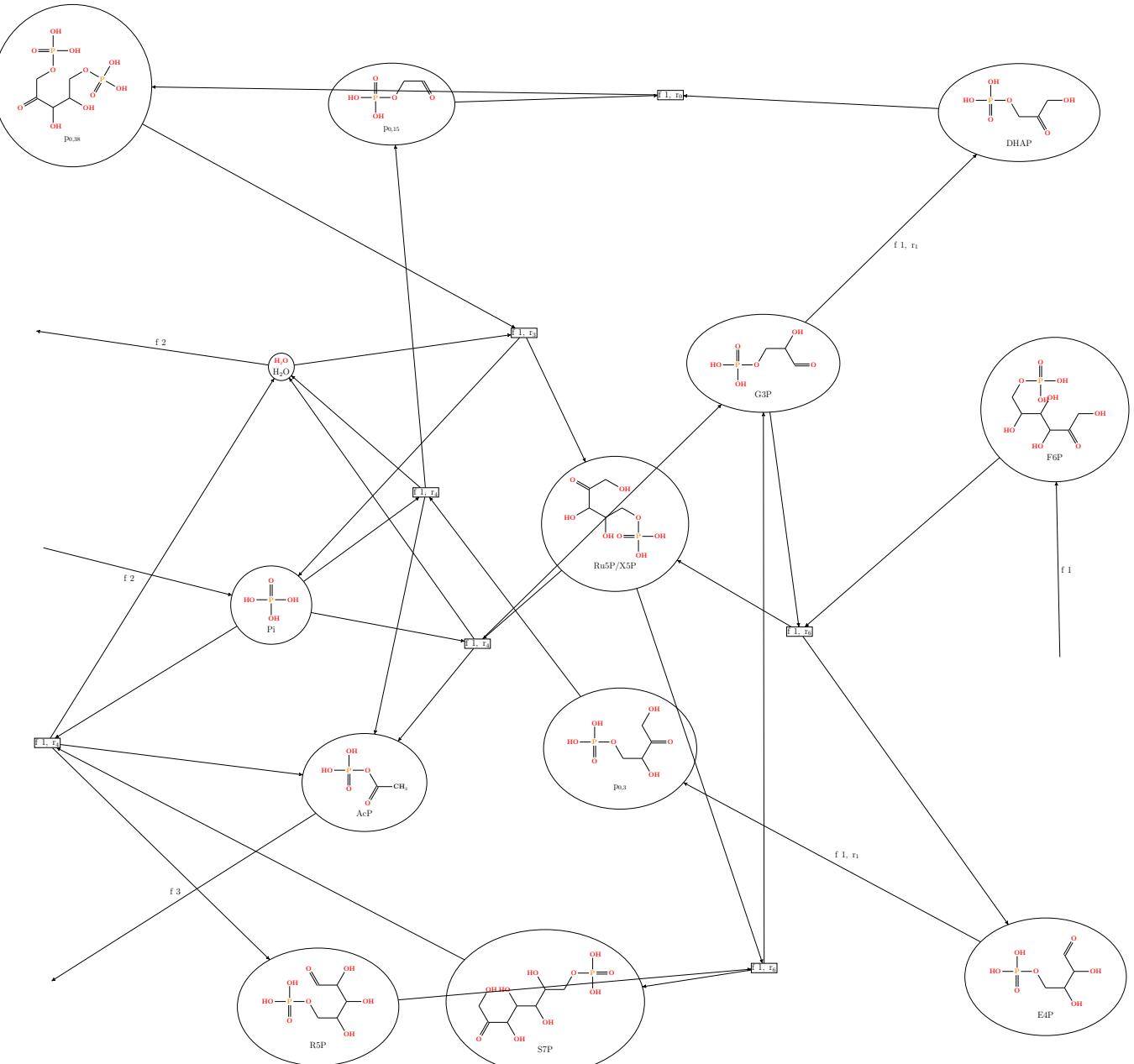
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> 0	0	2
Pi	2	0

## Filtered Graph



File: out/589\_dg\_0\_11100\_f\_0\_21\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.4 Solution 22

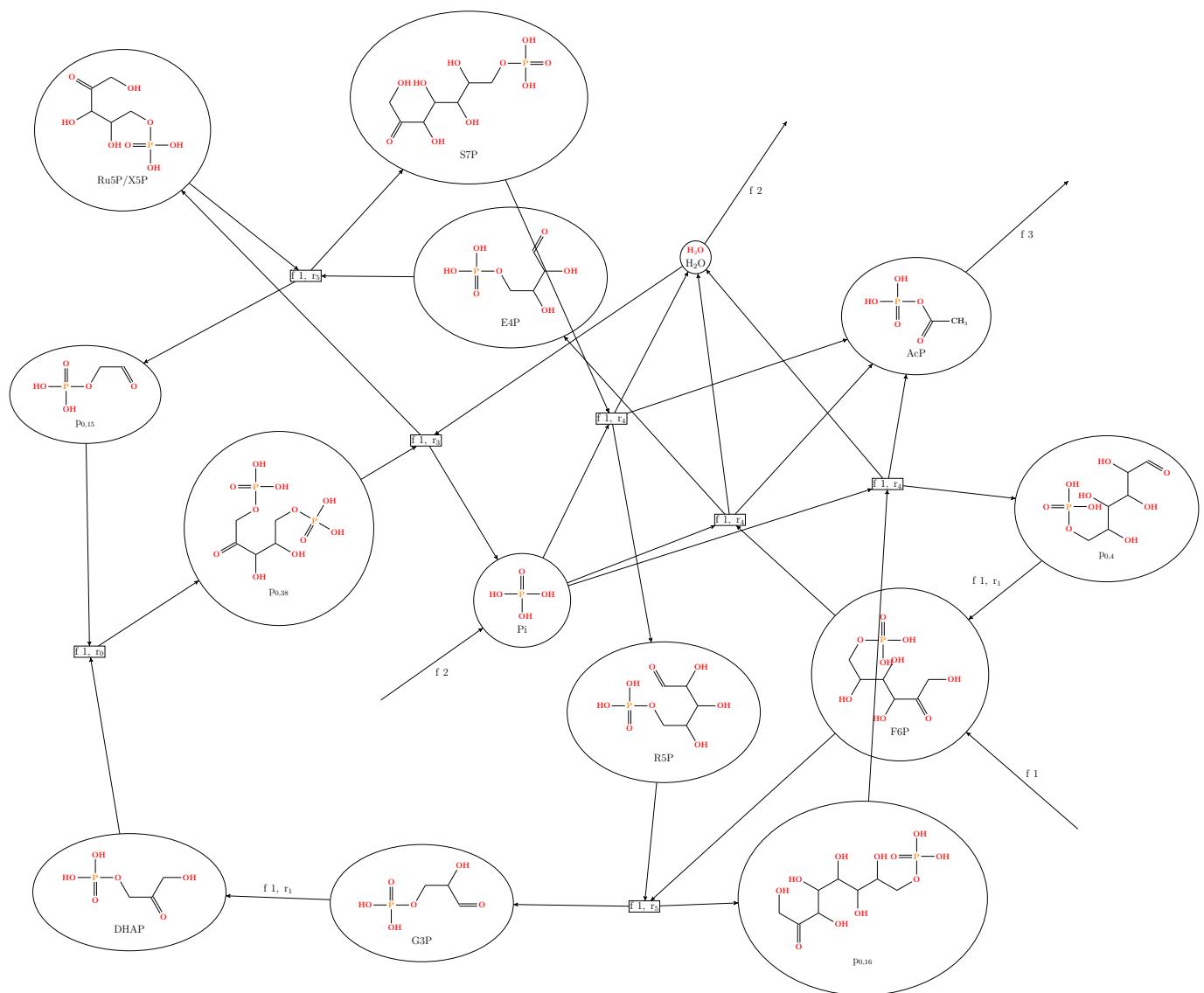
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



### 0.18.5 – 501

## Overall Data

### Objective value (in)

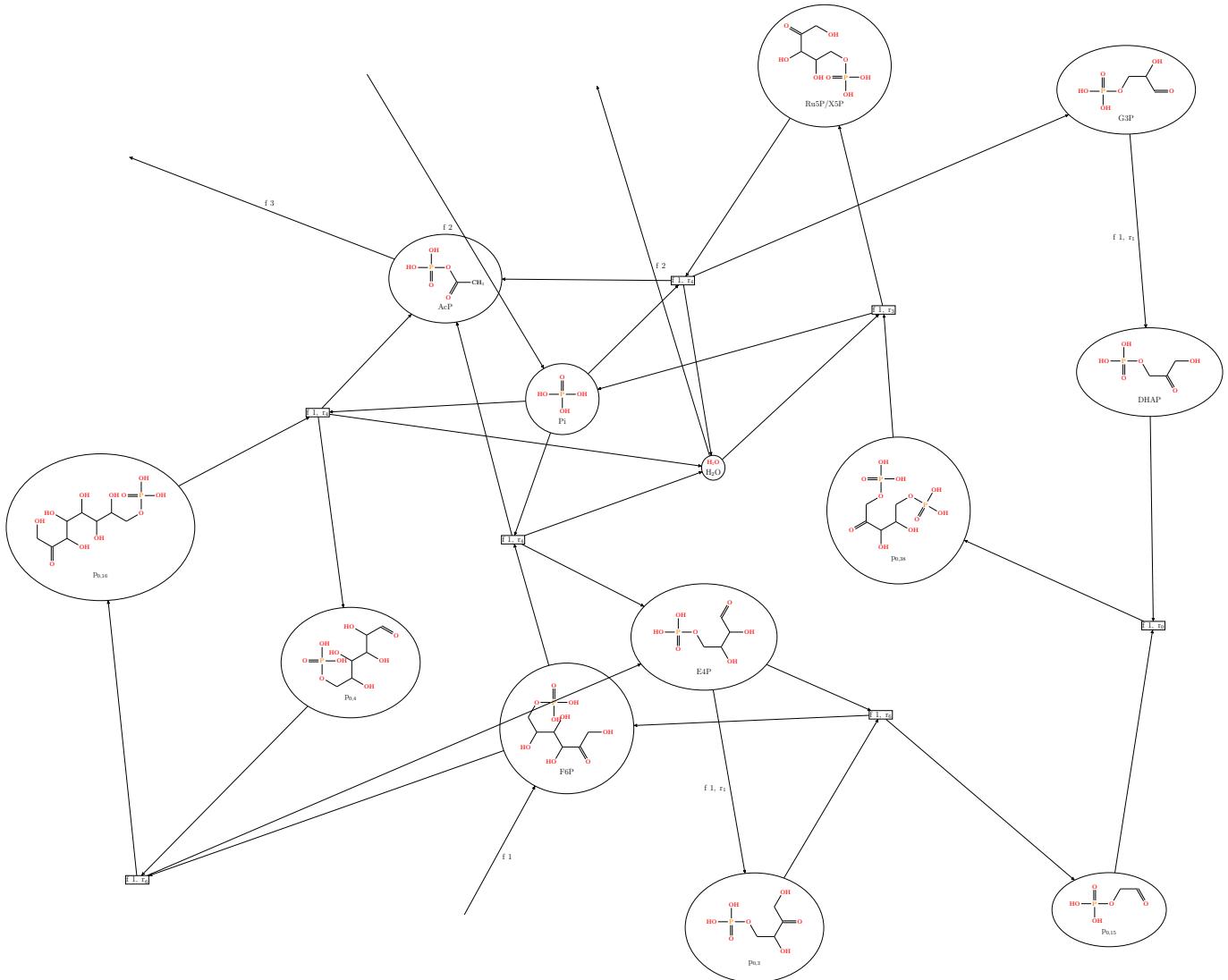
## Vertex/Graph In Out

AcP 0 3

F6P 1 0

H\_20 0 2

## Filtered Graph



File: out/599\_dg\_0\_11100\_f\_0\_25\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.6 Solution 28

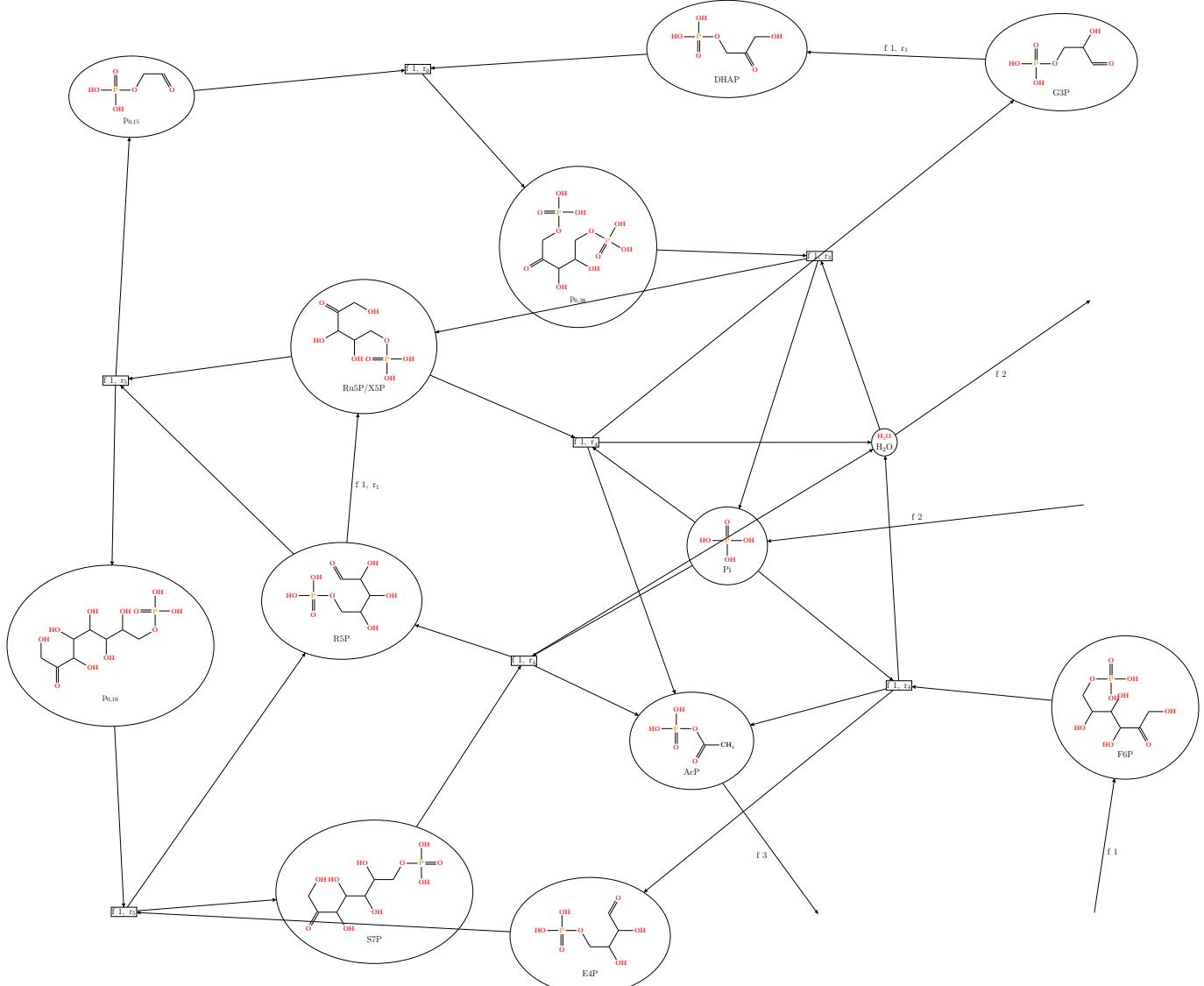
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/604\_dg\_0\_11100\_f\_0\_28\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.7 Solution 30

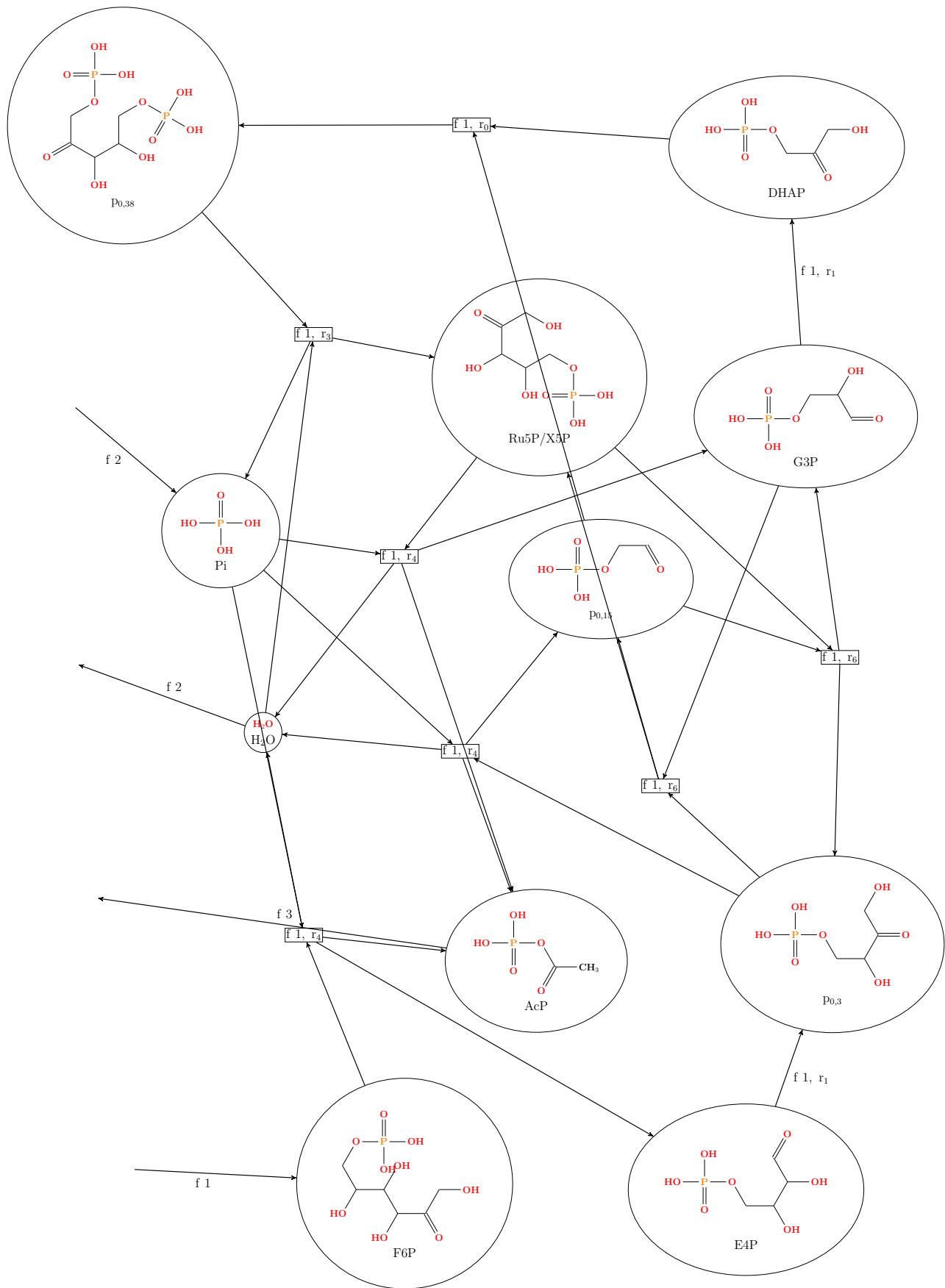
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/609\_dg\_0\_11100\_f\_0\_30\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.8 Solution 33

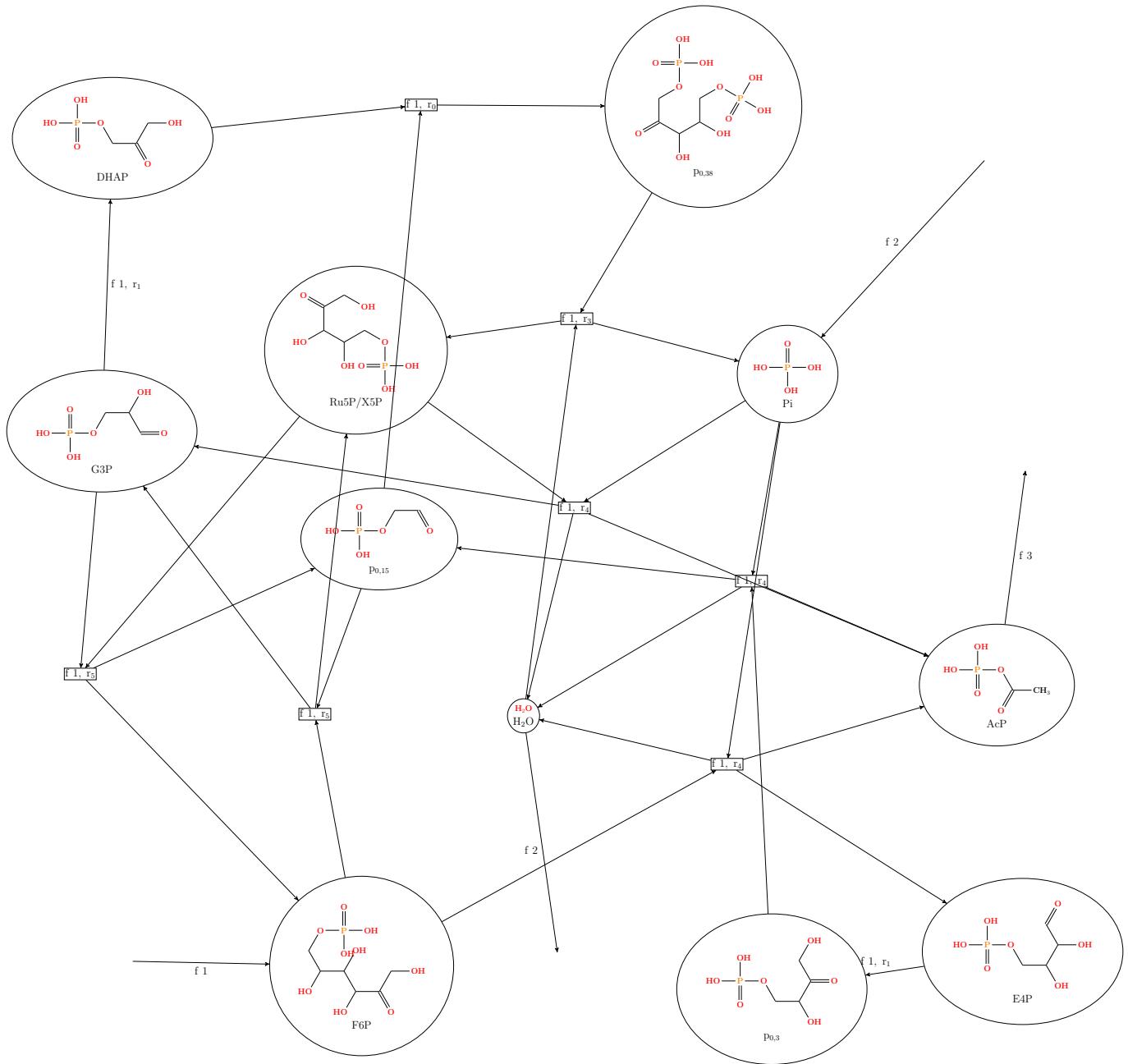
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/614\_dg\_0\_11100\_f\_0\_33\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.9 Solution 34

### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

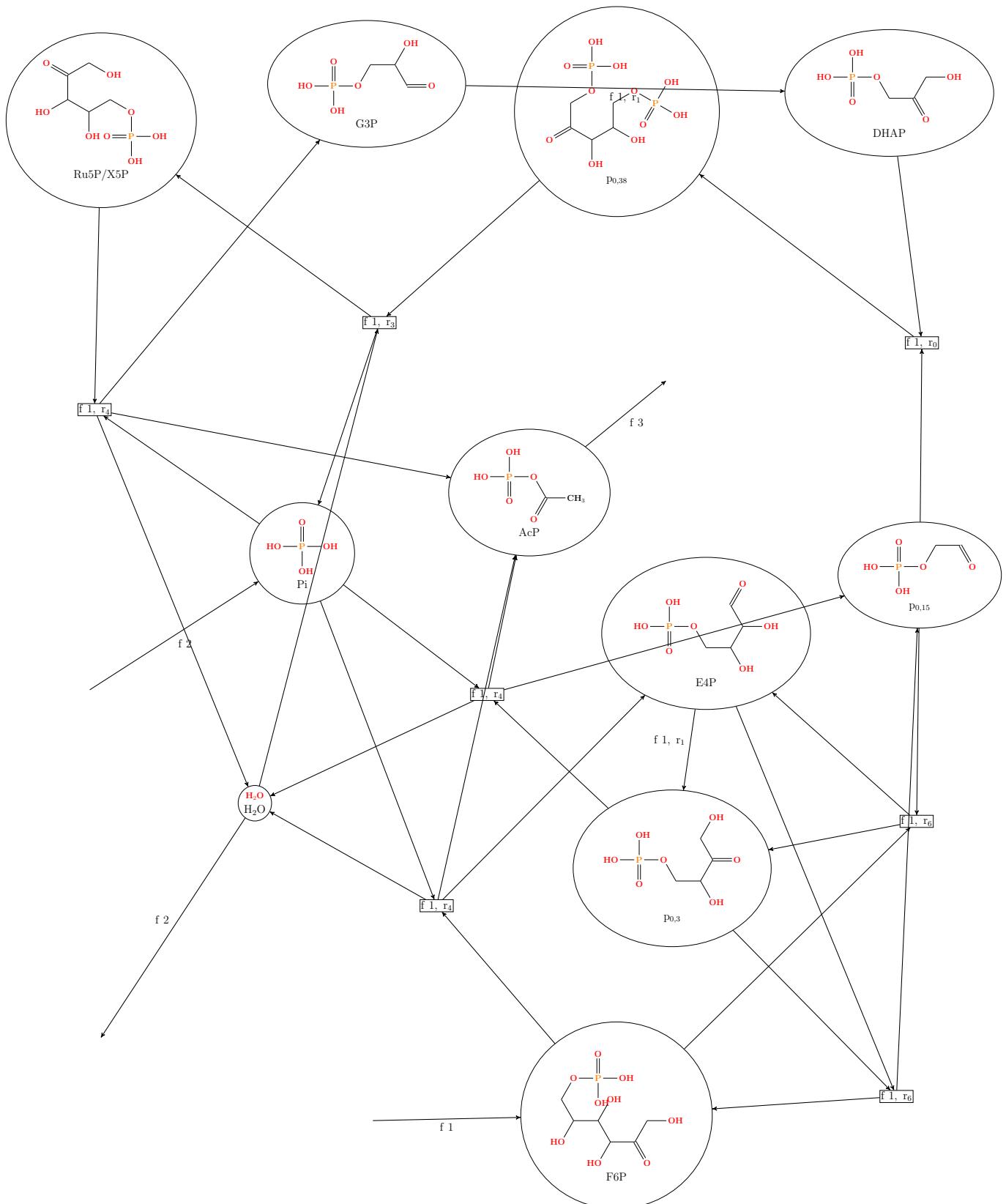
AcP 0 3

F6P 1 0

H\_2O 0 2

Pi 2 0

## Filtered Graph



File: out/619\_dg\_0\_11100\_f\_0\_34\_filt

$|E| = 9 \ |P| = 9$

## 0.18.10 Solution 35

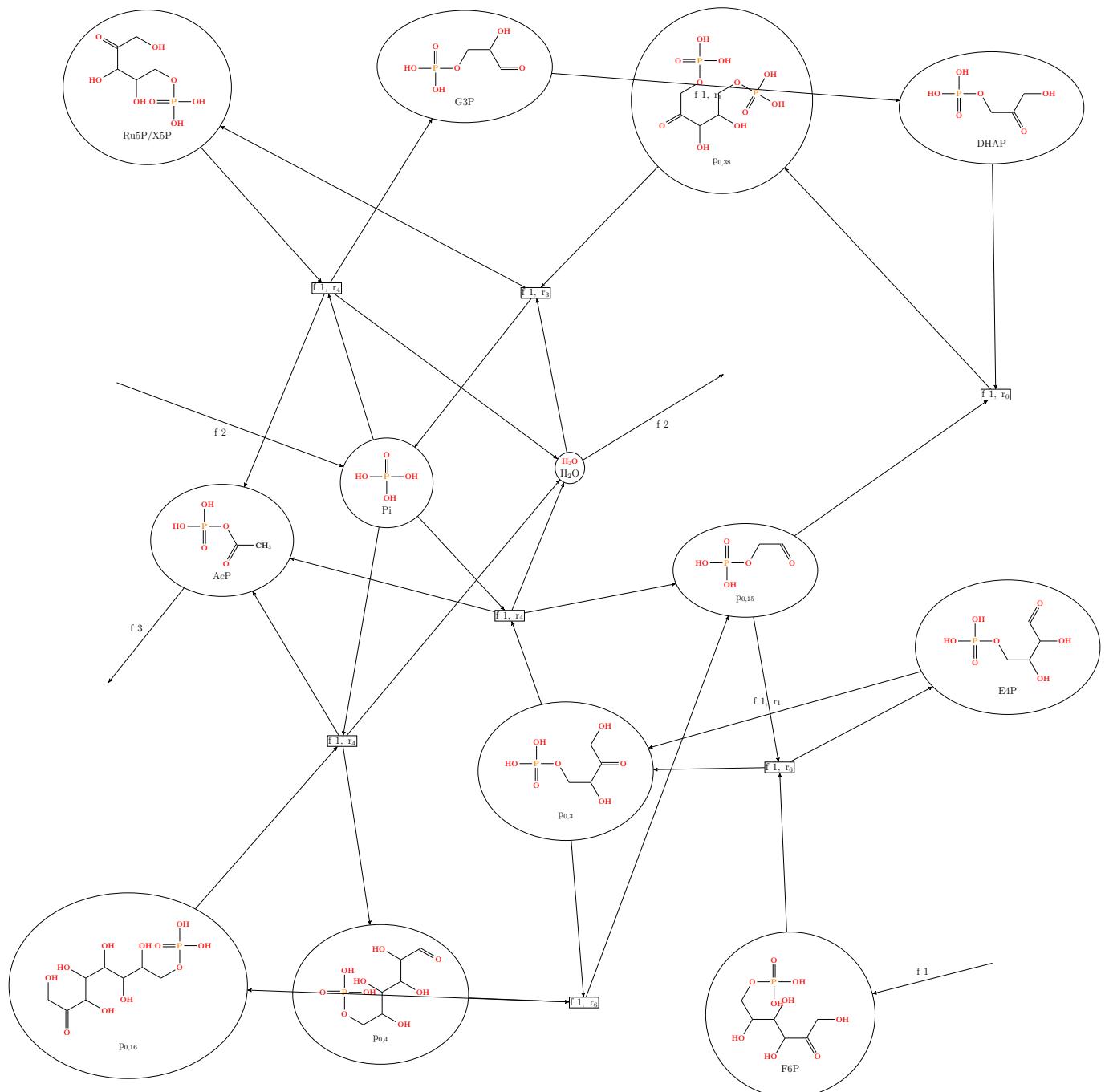
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/624\_dg\_0\_11100\_f\_0\_35\_filt

|E| = 9 |P| = 9

### 0.18.11 Solution 36

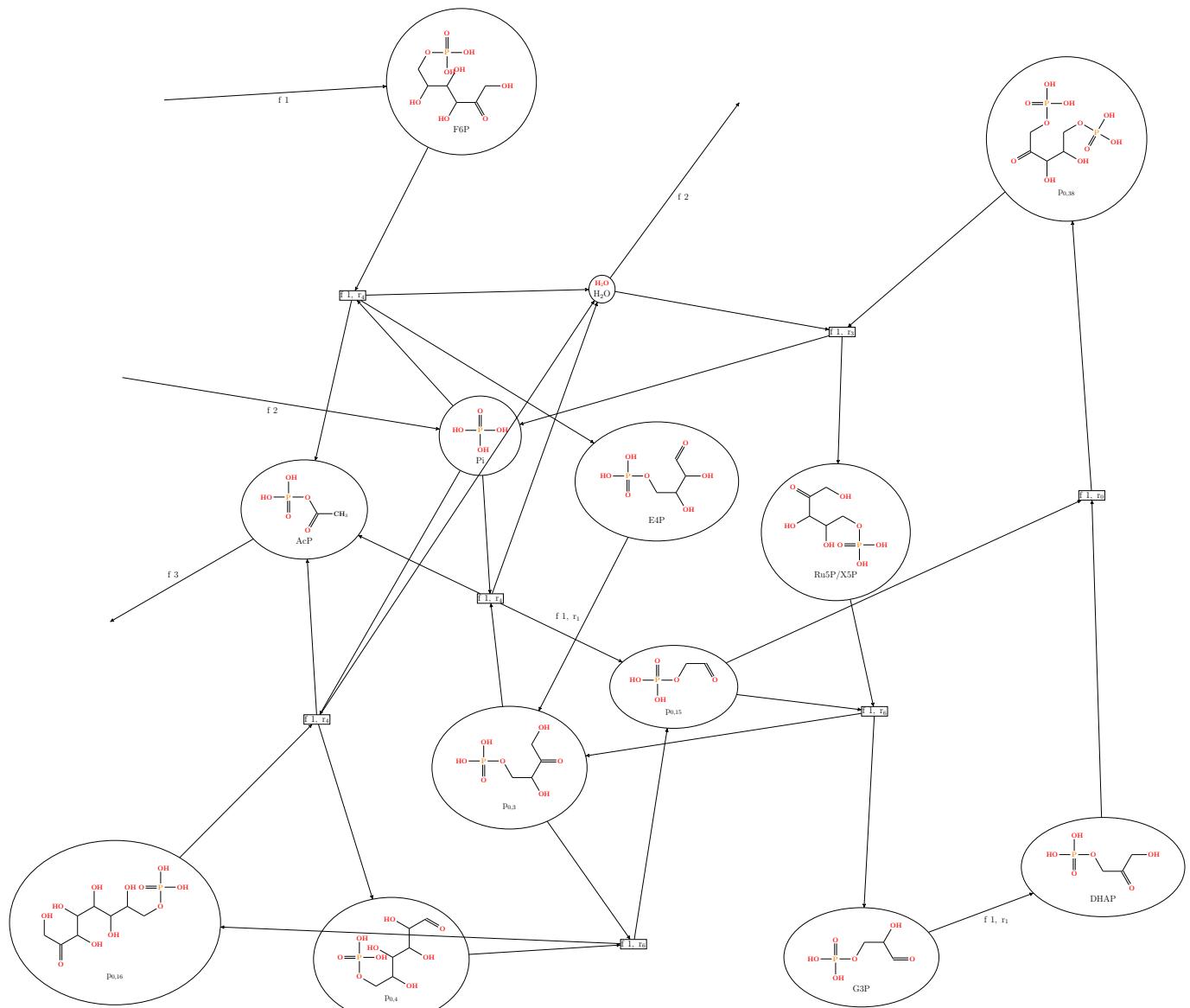
## Overall Data

Objective value (integral): 9

### Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/629\_dg\_0\_11100\_f\_0\_36\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.12 Solution 37

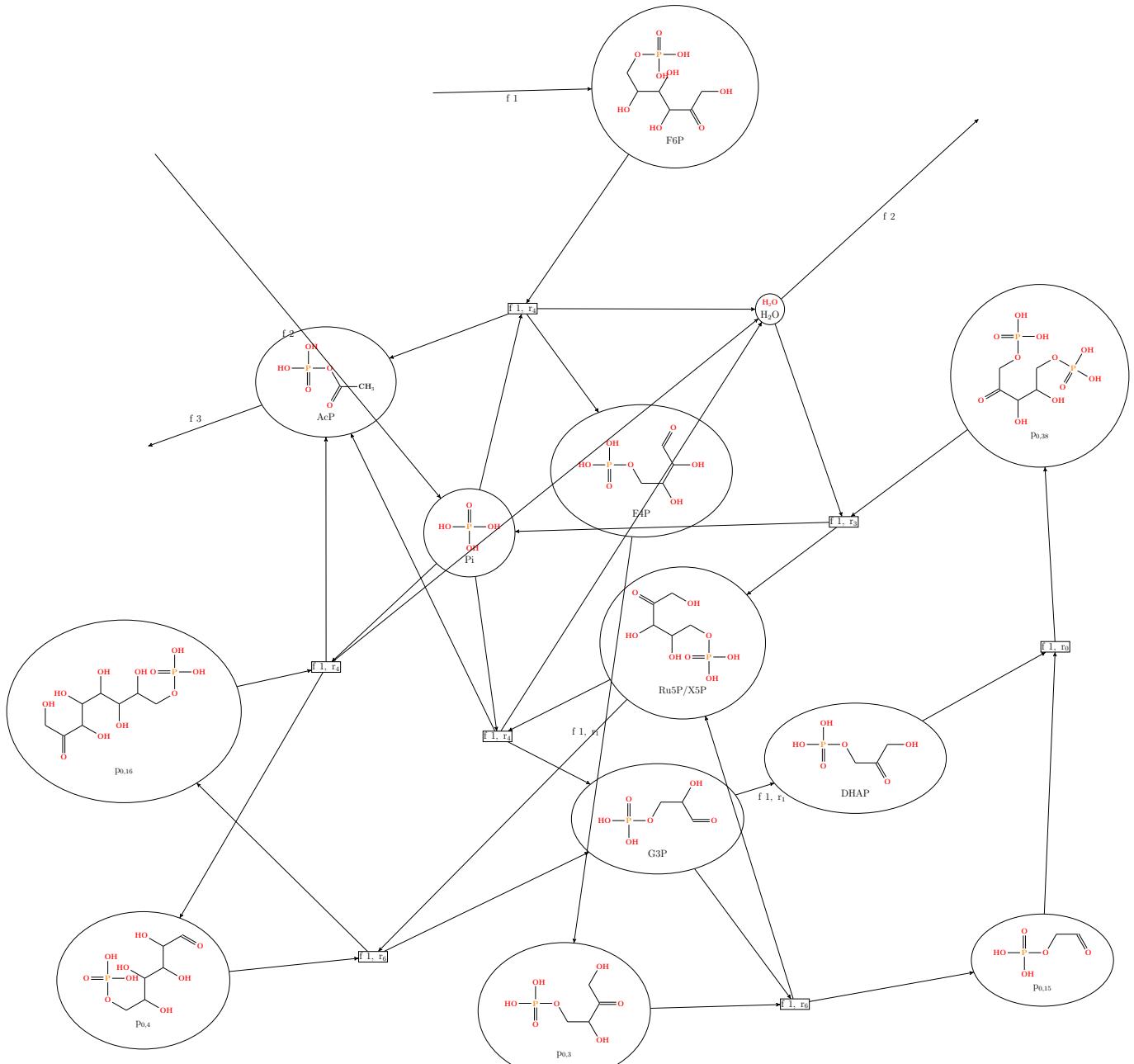
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/634\_dg\_0\_11100\_f\_0\_37\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.13 Solution 39

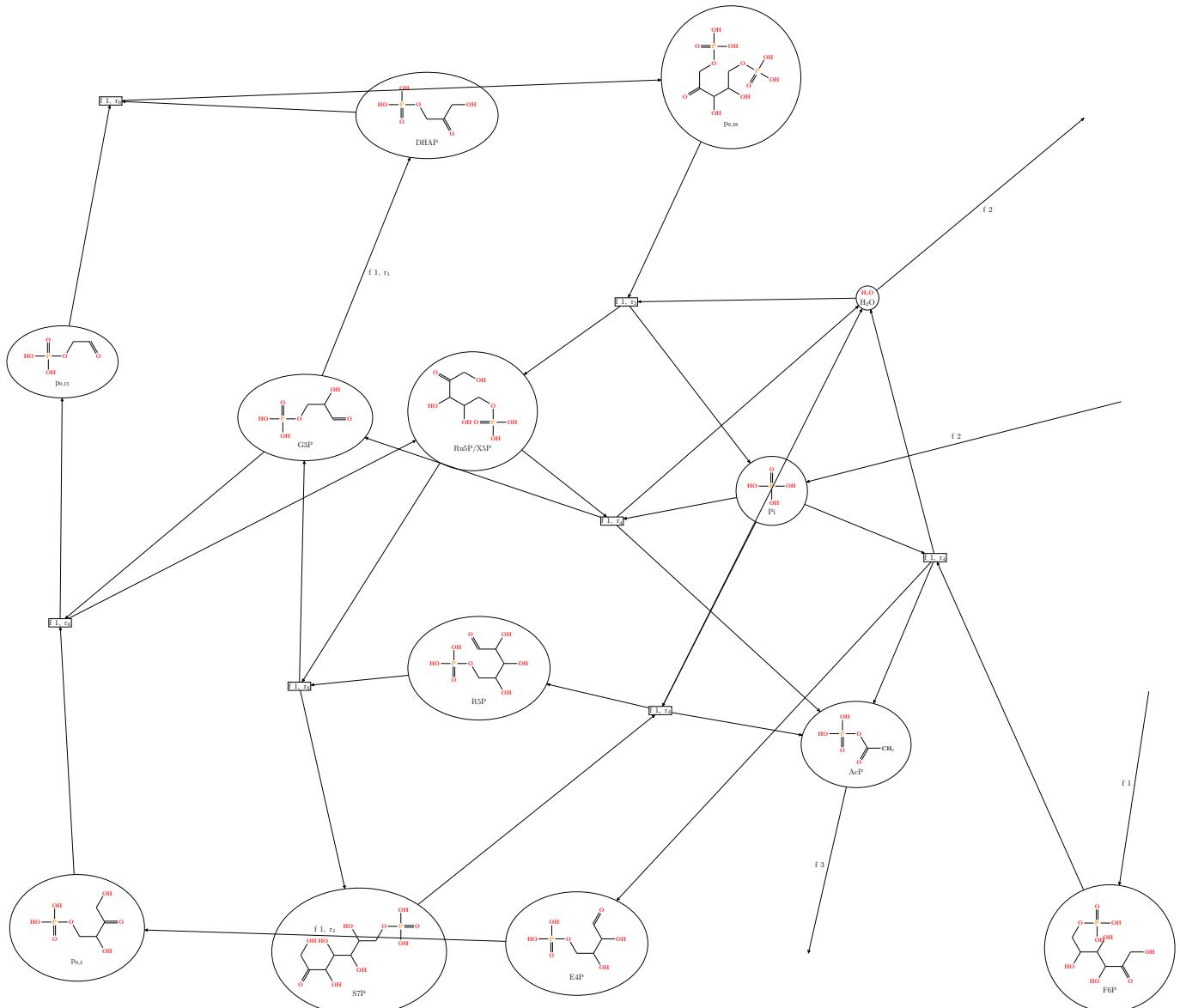
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

#### Filtered Graph



File: out/639\_dg\_0\_11100\_f\_0\_39\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.14 Solution 42

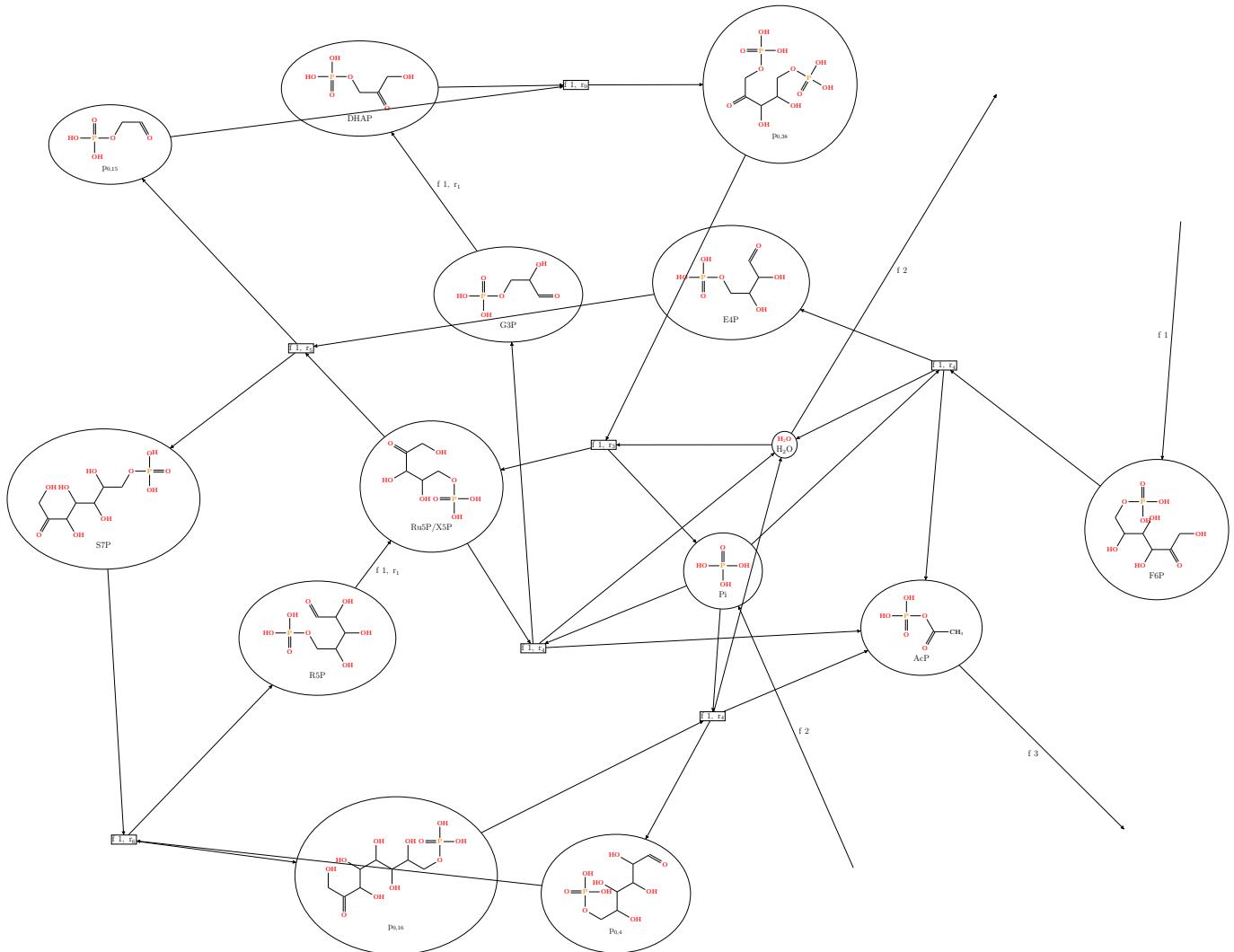
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/644\_dg\_0\_11100\_f\_0\_42\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.15 Solution 46

### Overall Data

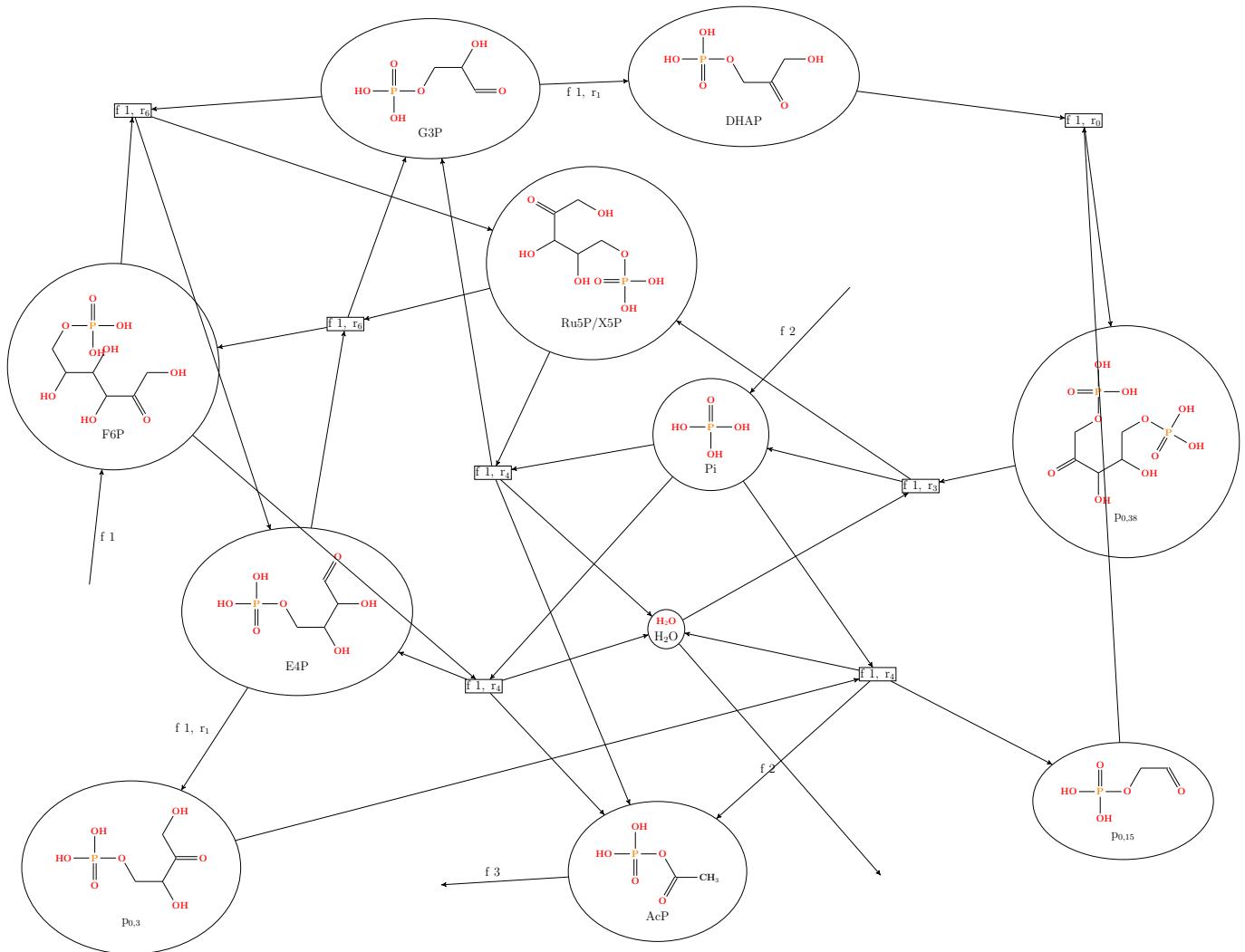
Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
-----	---	---

F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/649\_dg\_0\_11100\_f\_0\_46\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.16 Solution 47

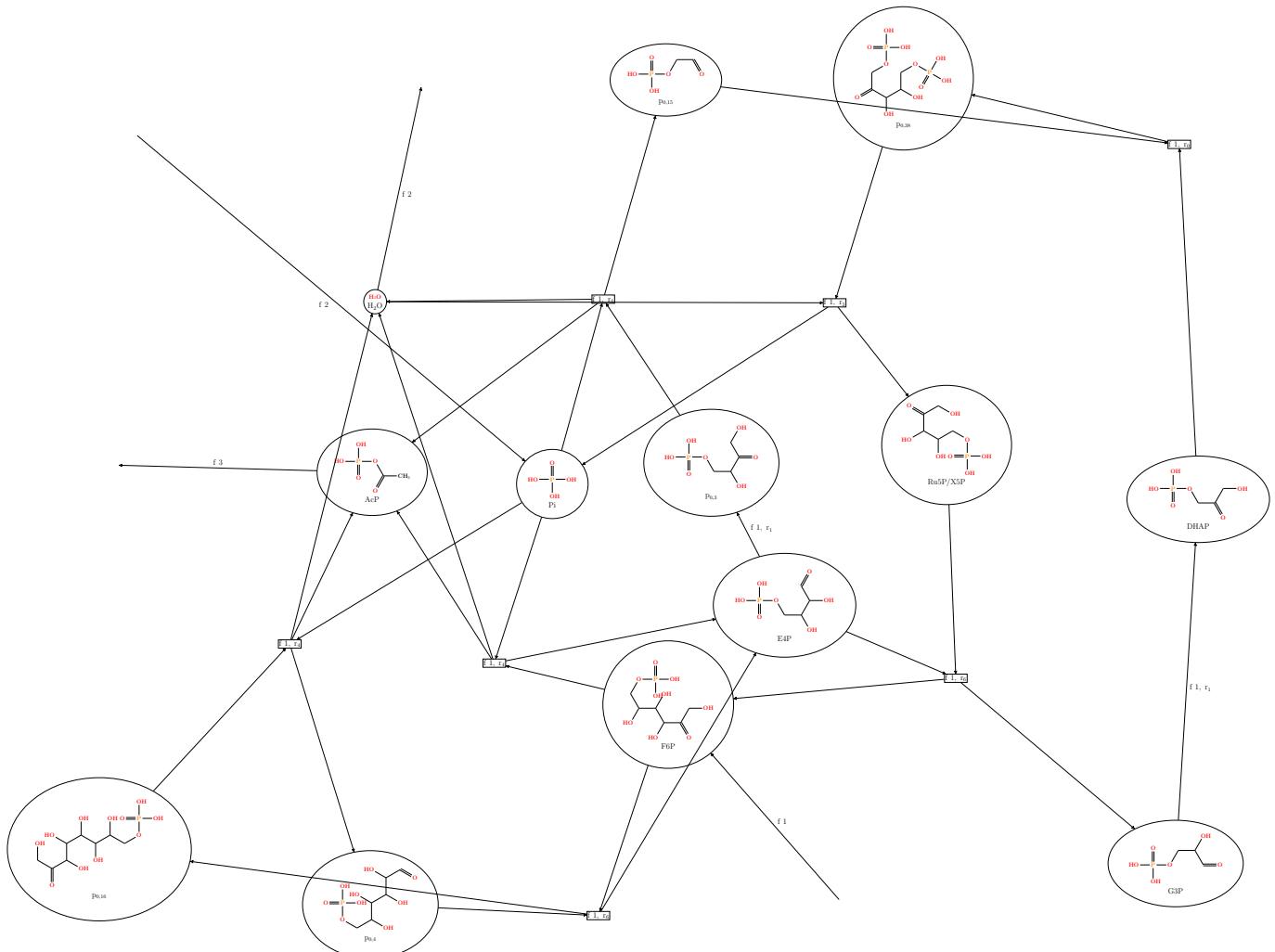
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/654\_dg\_0\_11100\_f\_0\_47\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.17 Solution 50

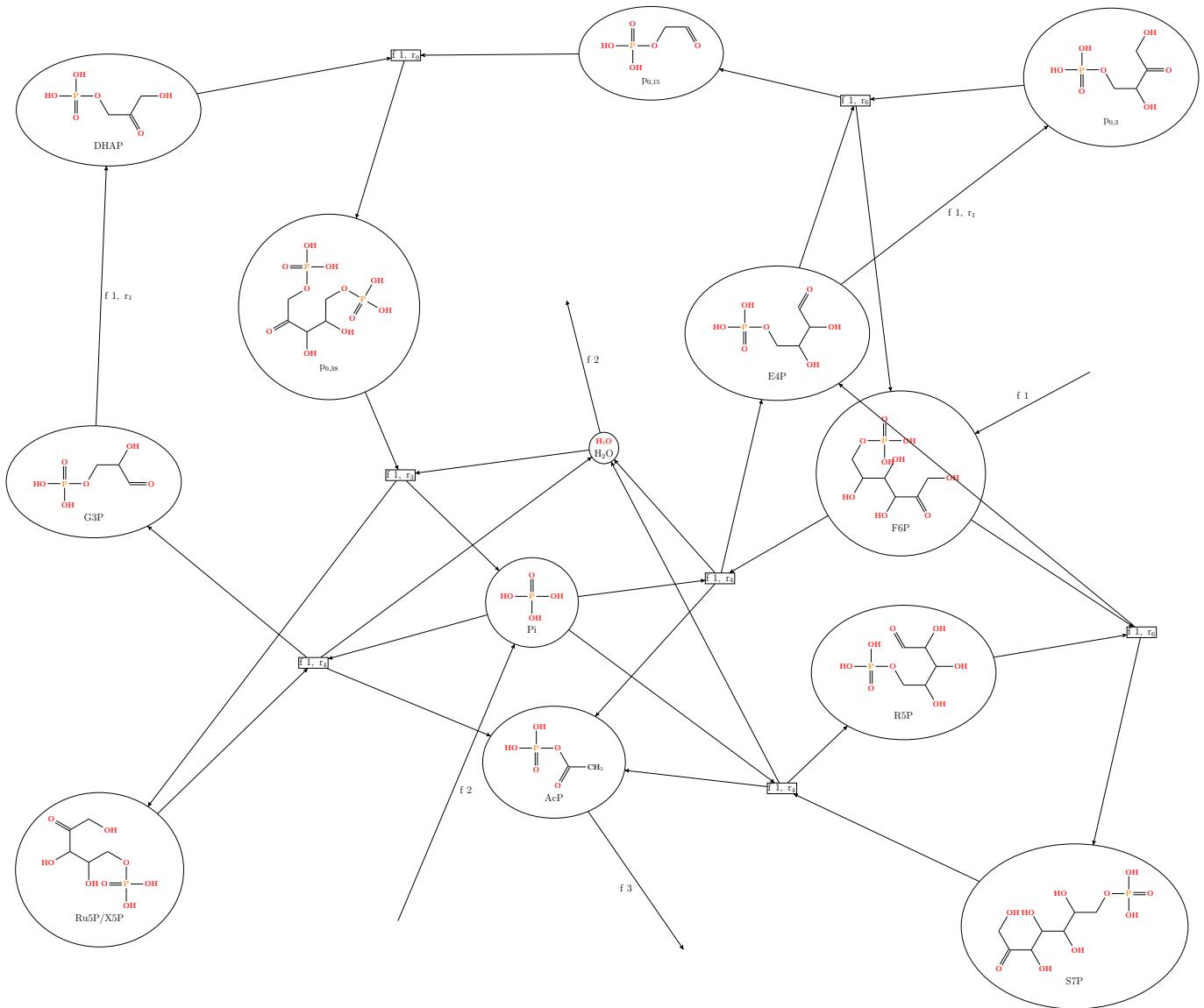
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/659\_dg\_0\_11100\_f\_0\_50\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.18 Solution 52

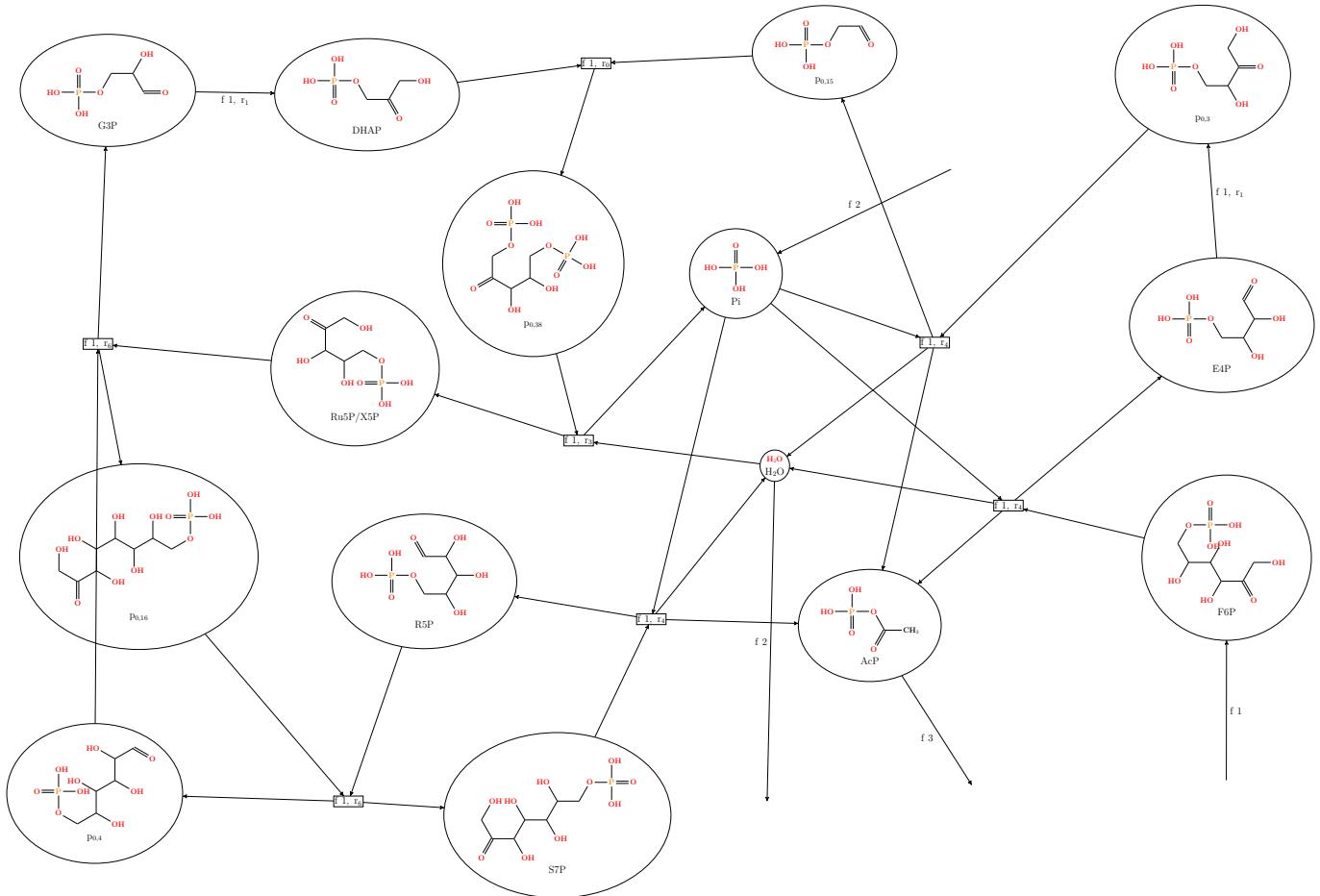
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/664\_dg\_0\_11100\_f\_0\_52\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.19 Solution 53

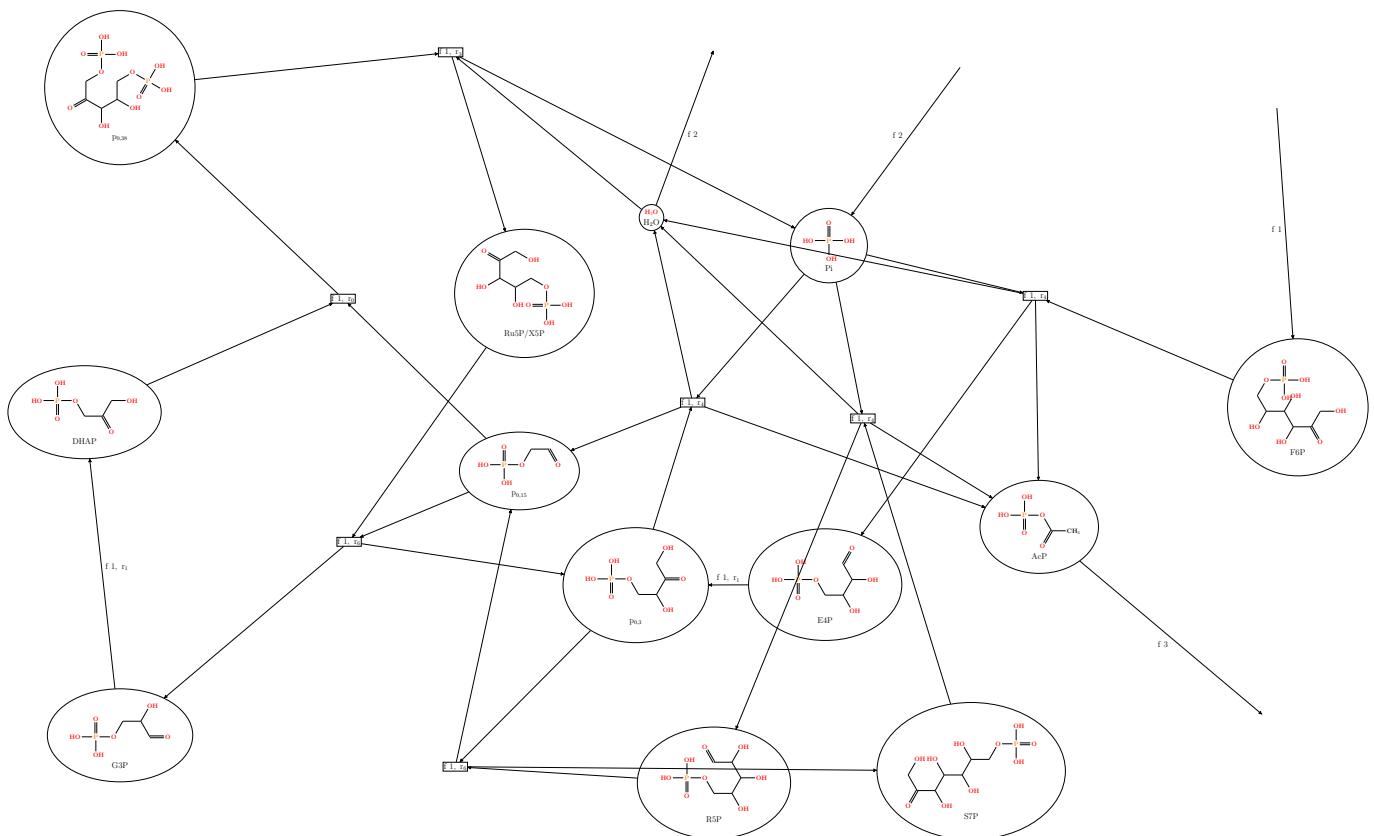
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/669\_dg\_0\_11100\_f\_0\_53\_filt

$$|E| = 9 \quad |P| = 9$$

0.18.20 Solution 57

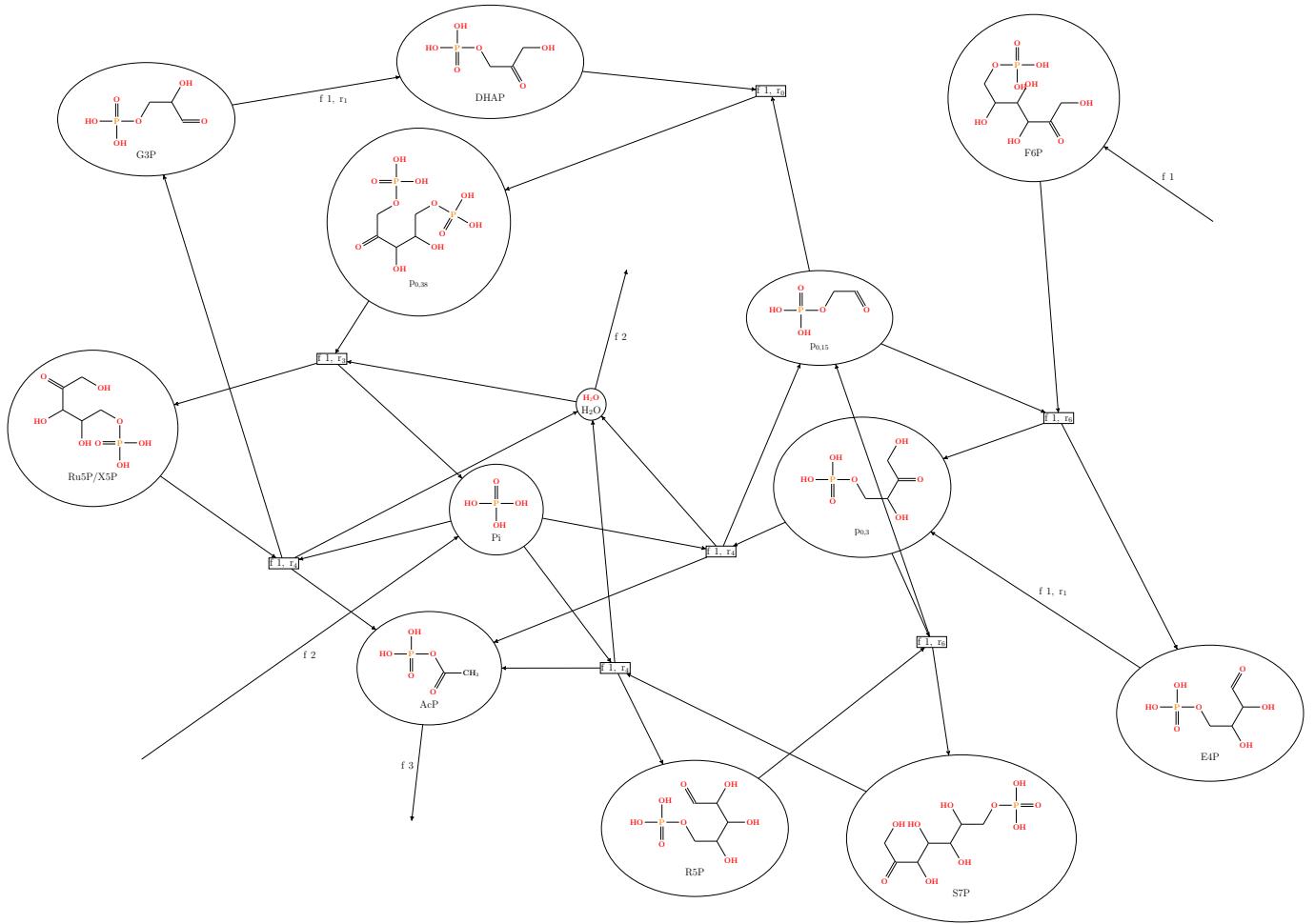
## Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/674\_dg\_0\_11100\_f\_0\_57\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.21 Solution 58

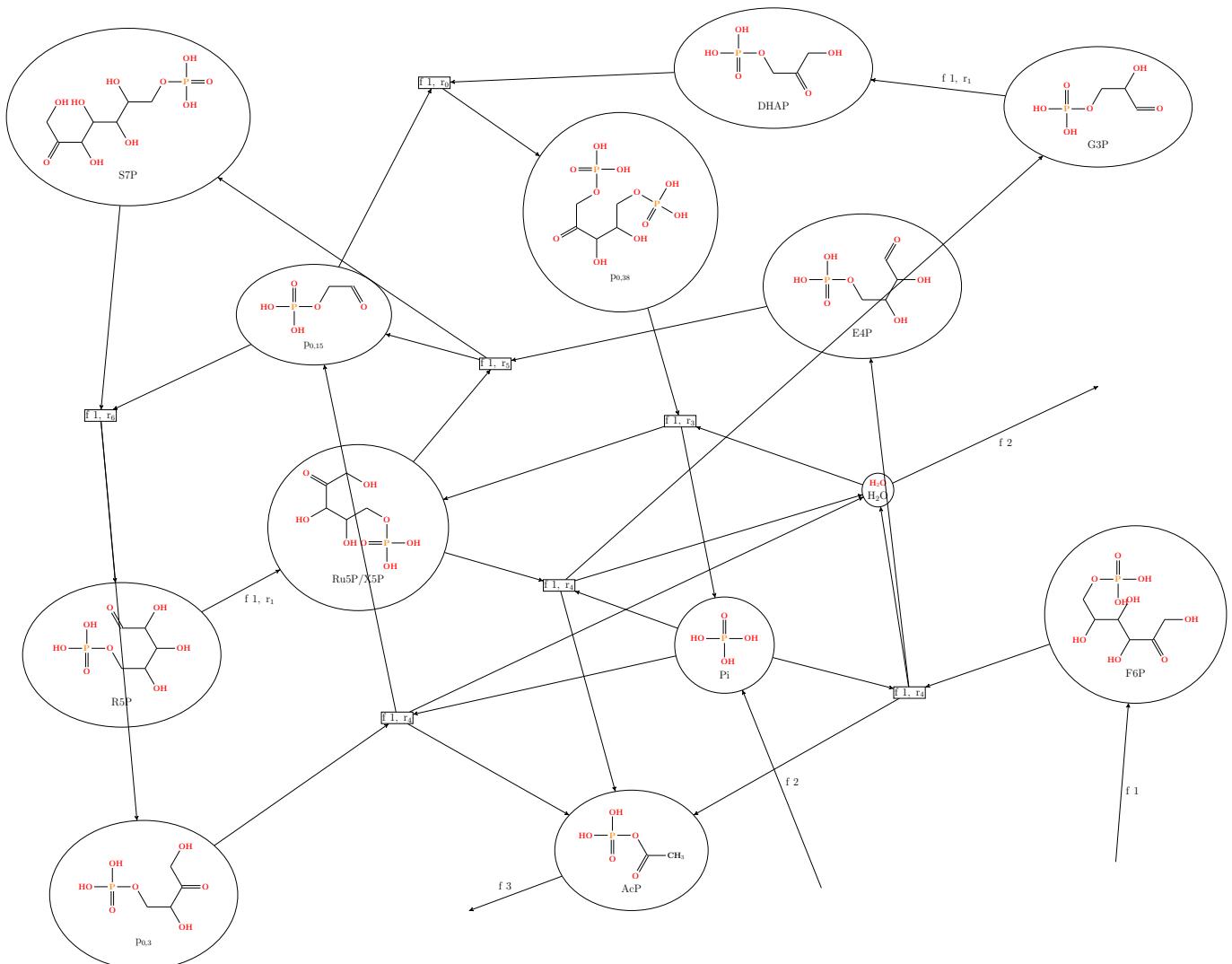
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/679\_dg\_0\_11100\_f\_0\_58\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.22 Solution 60

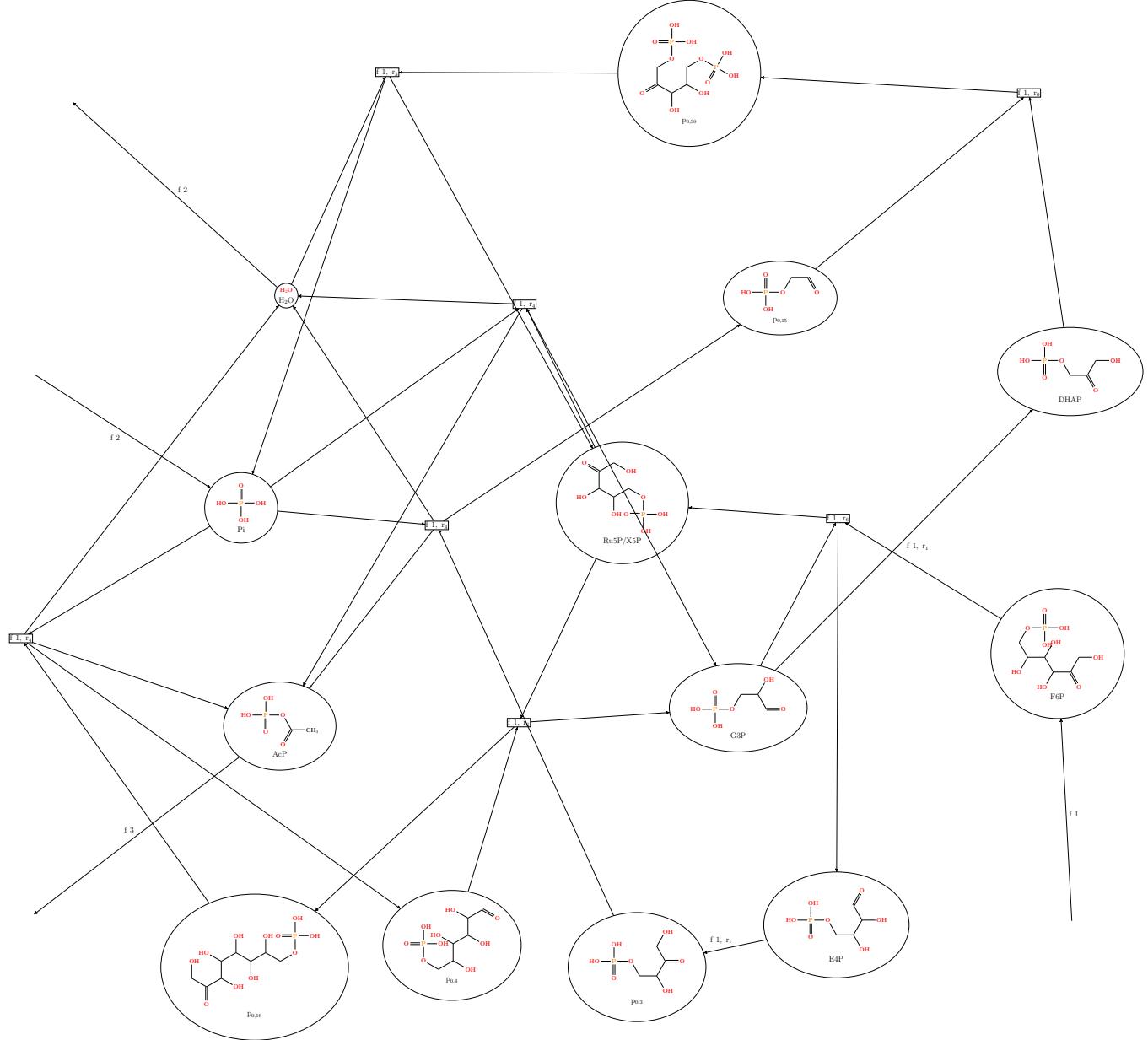
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/684\_dg\_0\_11100\_f\_0\_60\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.23 Solution 65

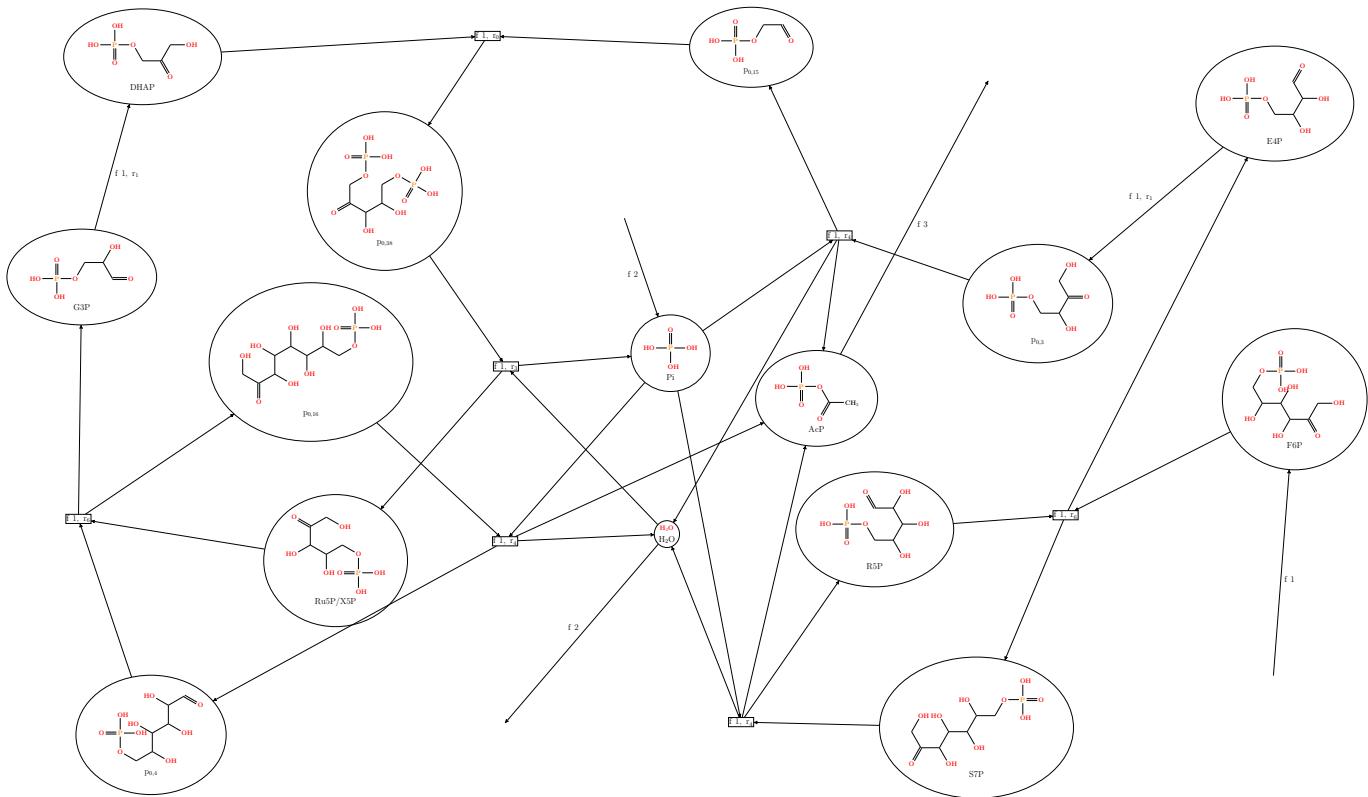
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/689\_dg\_0\_11100\_f\_0\_65\_filt

$$|E| = 9 \quad |P| = 9$$

0.18.24 Solution 66

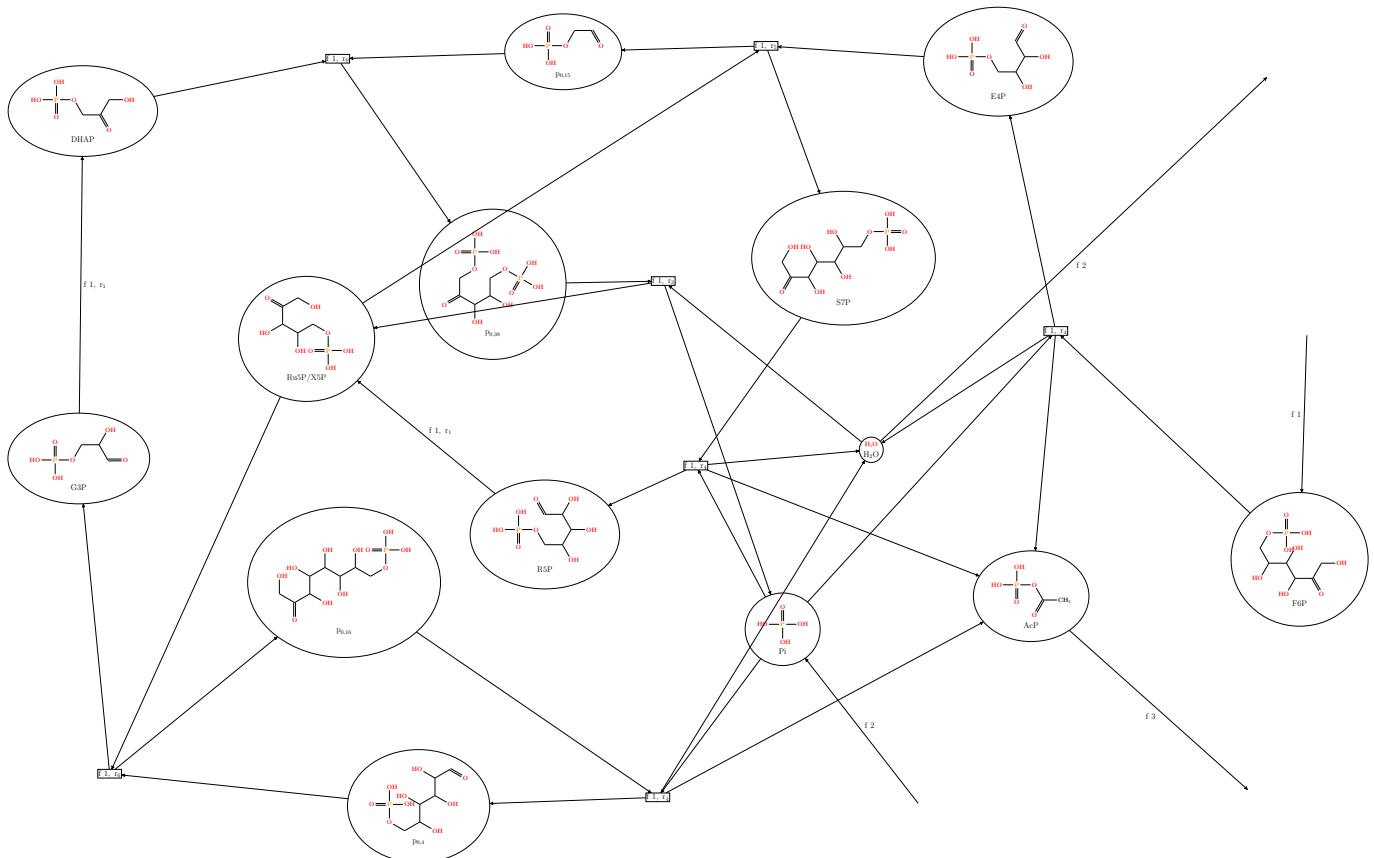
## Overall Data

Objective value (integral): 9

### Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/694\_dg\_0\_11100\_f\_0\_66\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.25 Solution 67

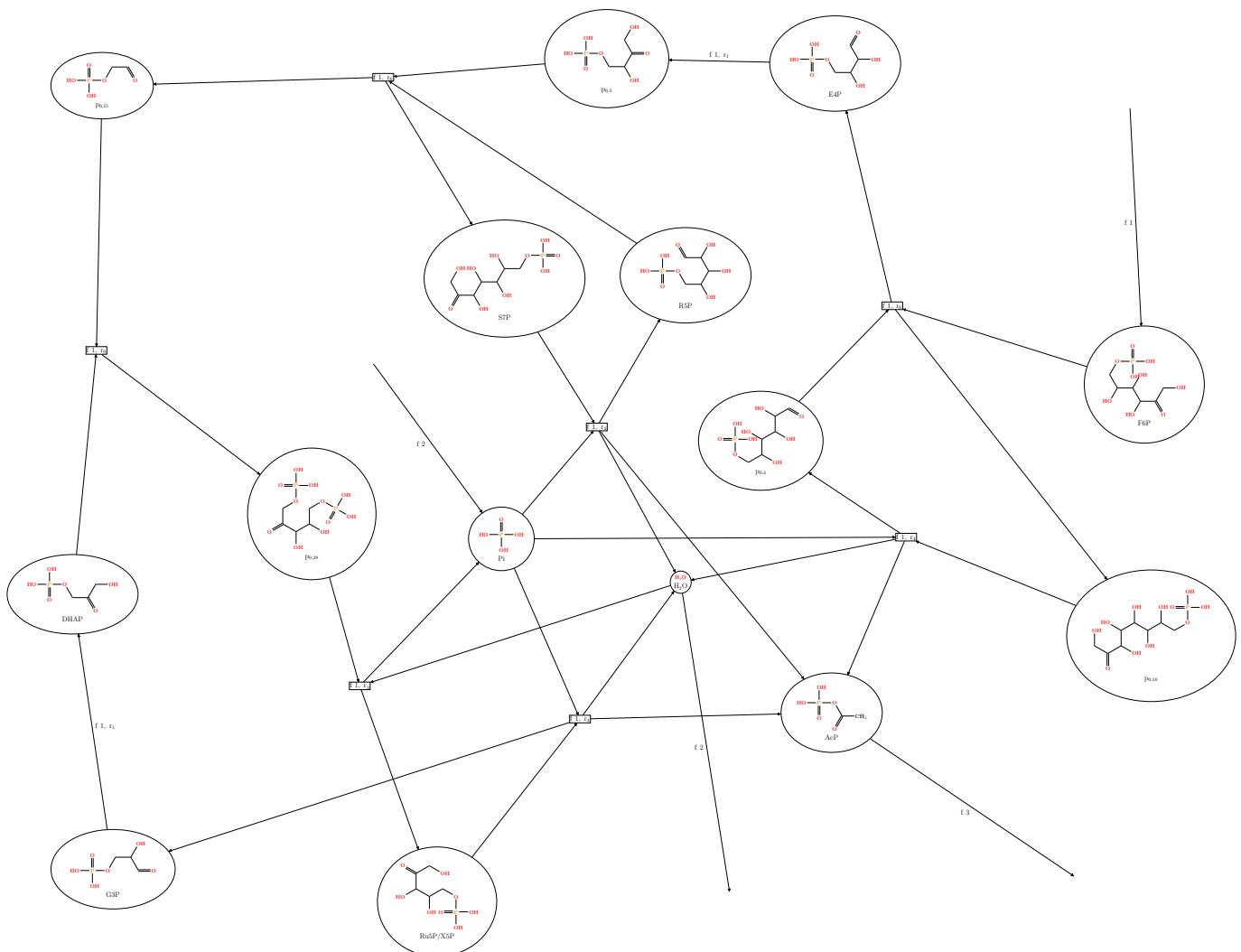
## Overall Data

Objective value (integral): 9

### Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/699\_dg\_0\_11100\_f\_0\_67\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.26 Solution 68

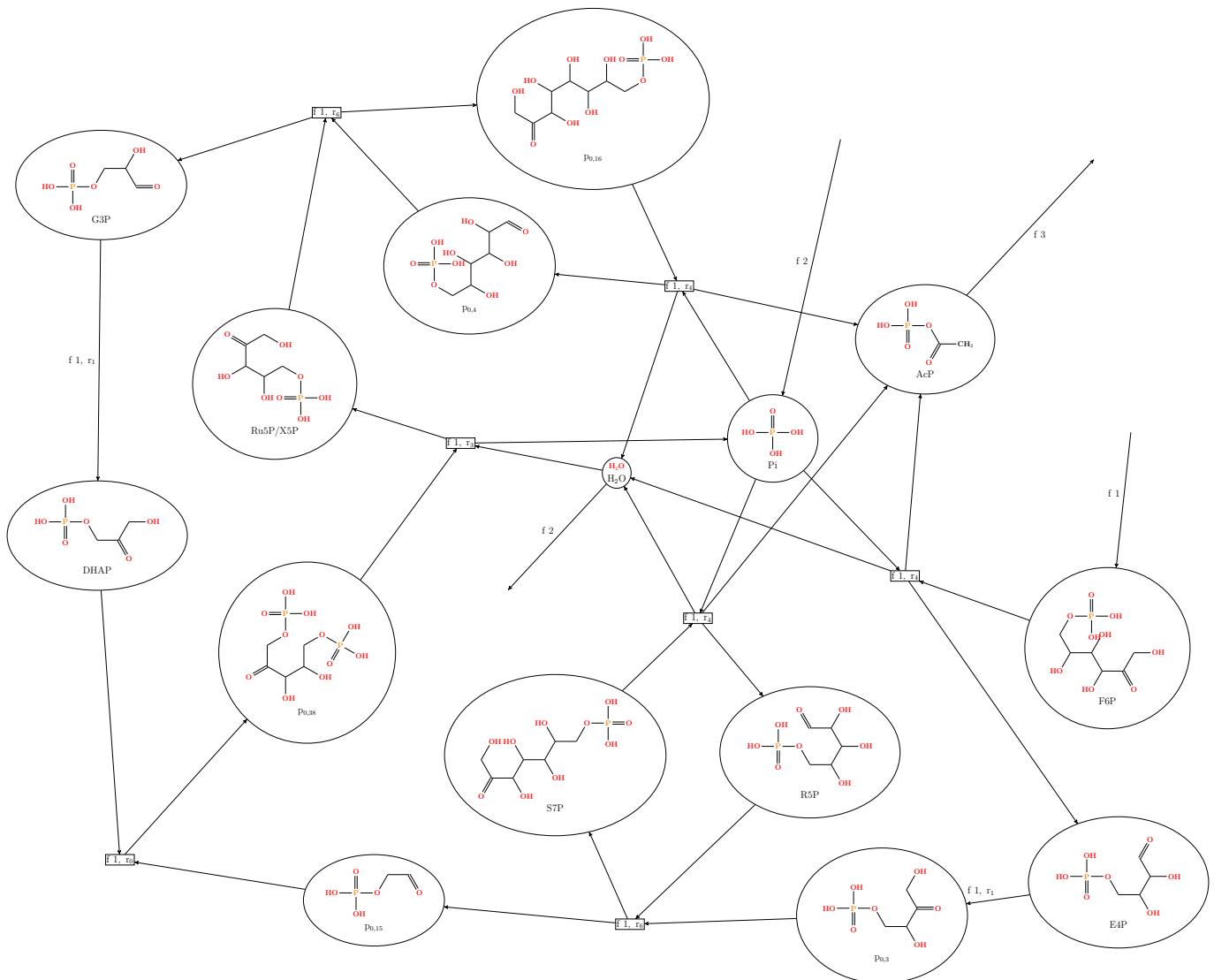
## Overall Data

Objective value (integral): 9

### Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/704\_dg\_0\_11100\_f\_0\_68\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.27 Solution 69

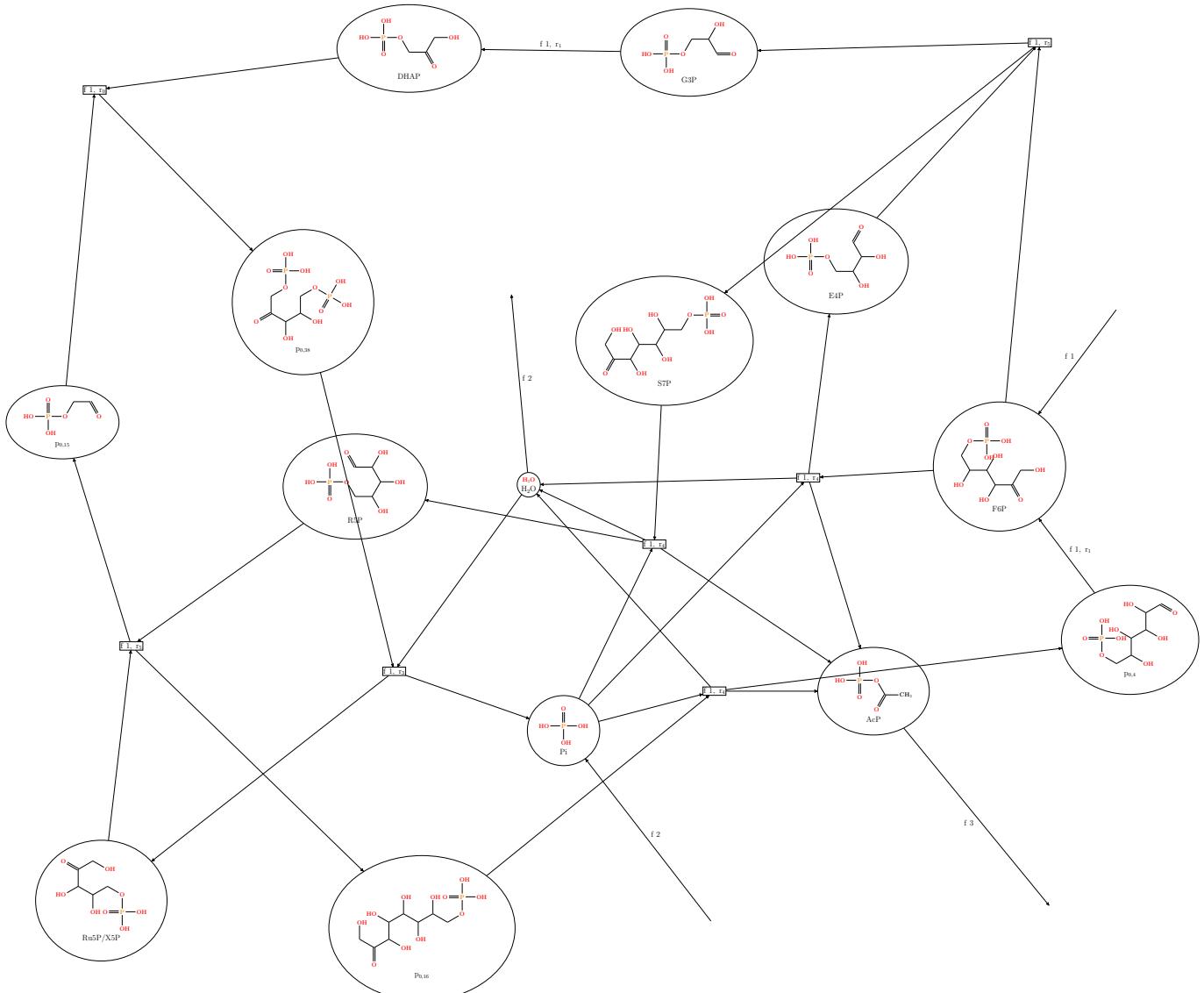
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/709\_dg\_0\_11100\_f\_0\_69\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.28 Solution 77

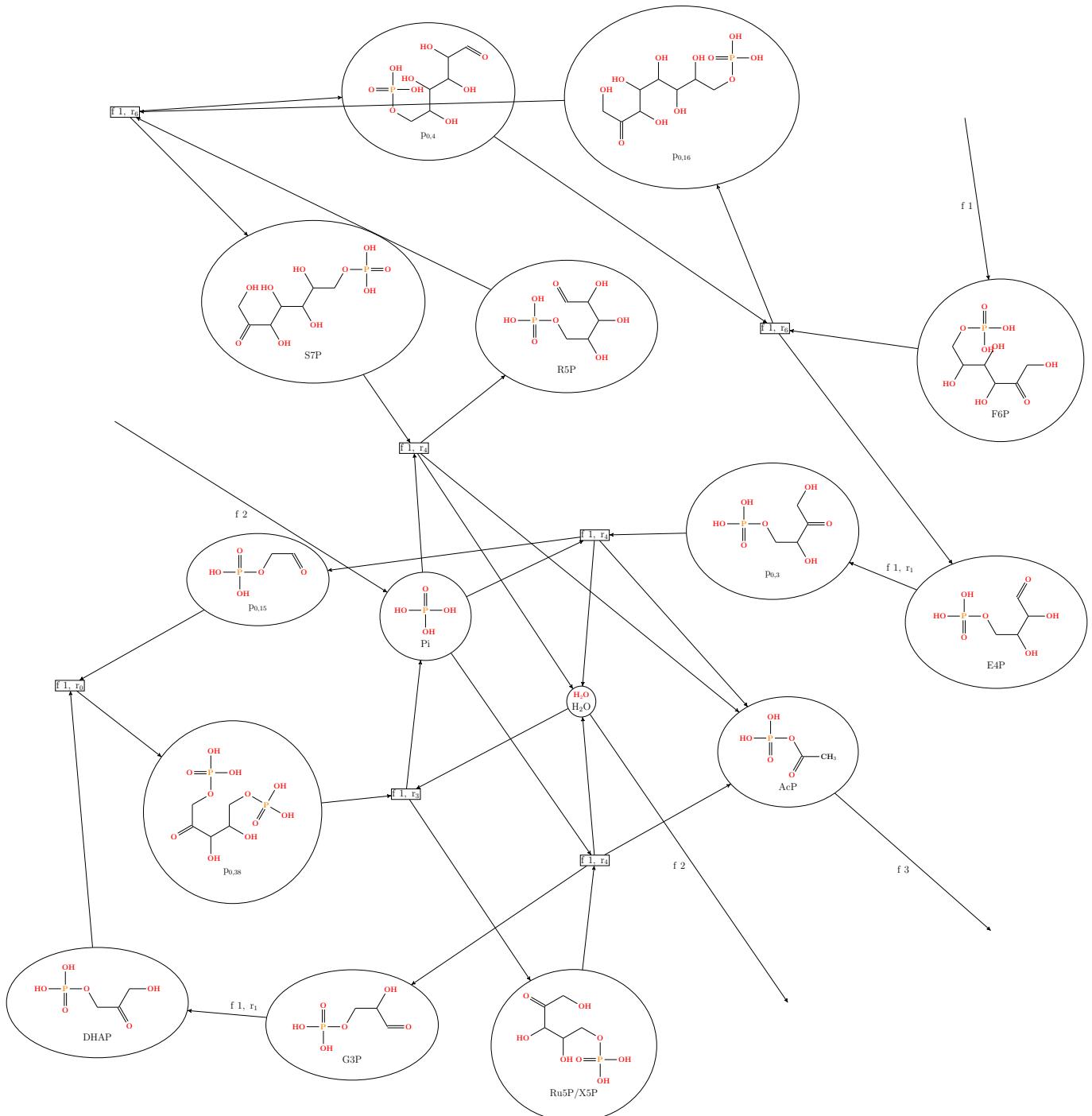
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/714\_dg\_0\_11100\_f\_0\_77\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.29 Solution 80

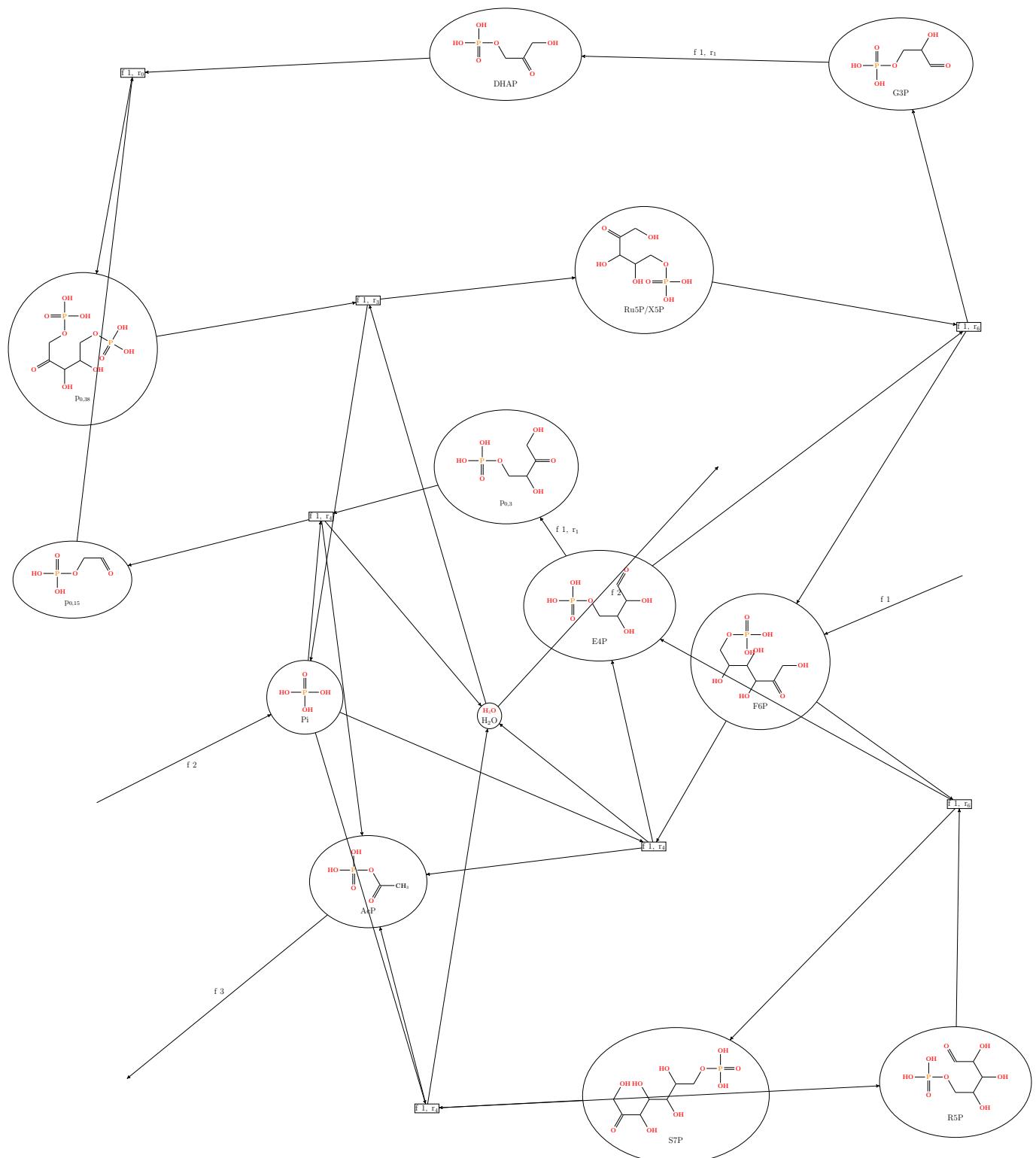
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2

## Filtered Graph



File: out/719\_dg\_0\_11100\_f\_0\_80\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.30 Solution 81

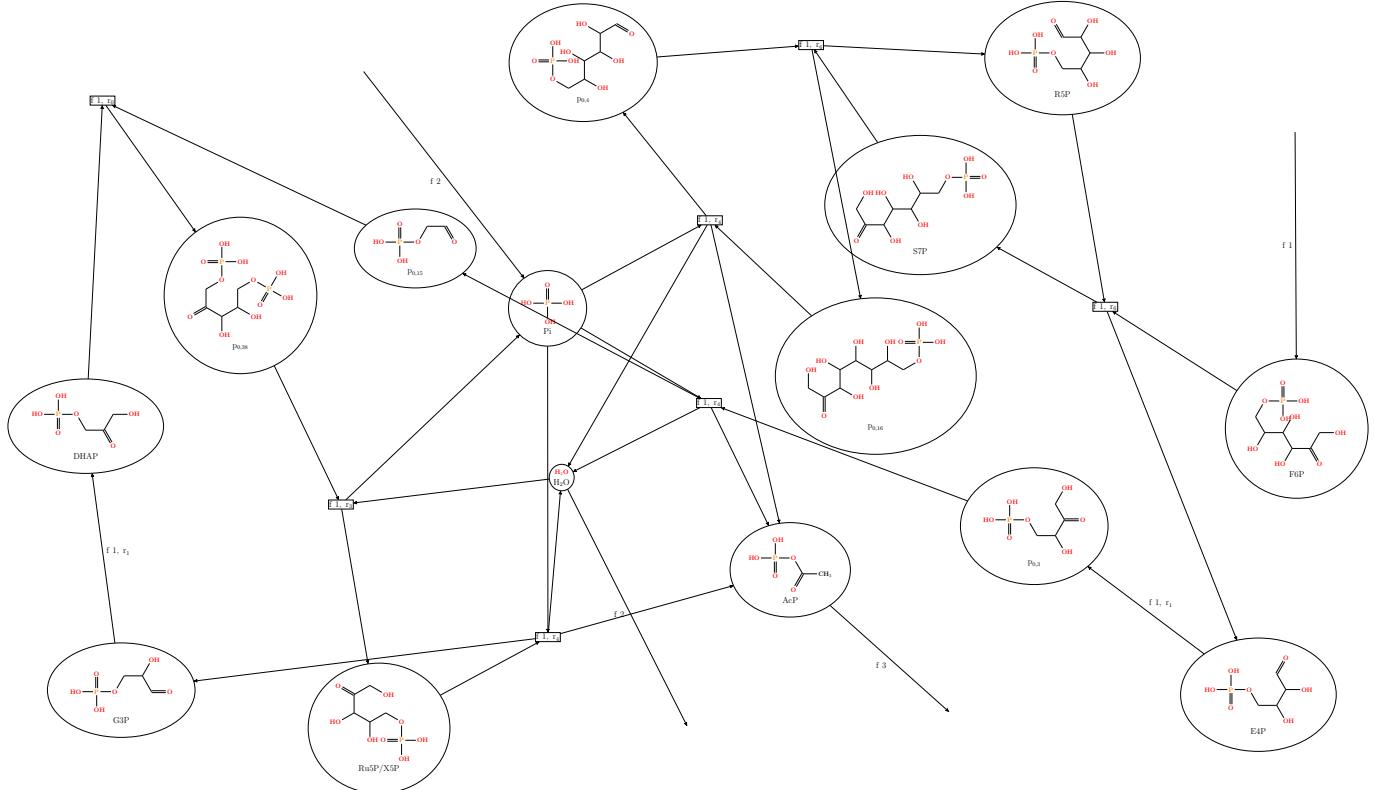
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

### Filtered Graph



File: out/724\_dg\_0\_11100\_f\_0\_81\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.18.31 Solution 82

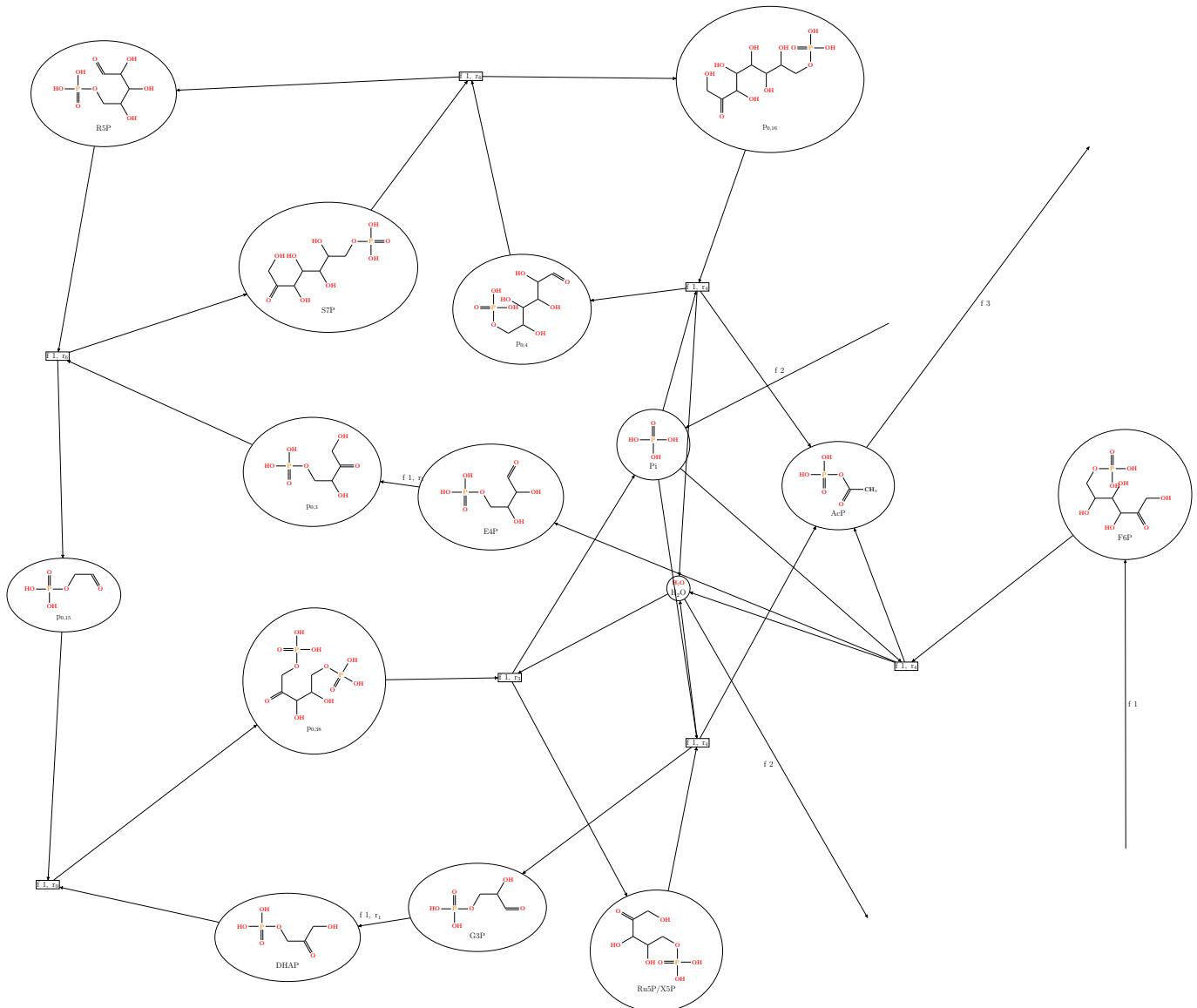
### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/729\_dg\_0\_11100\_f\_0\_82\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.32 Solution 85

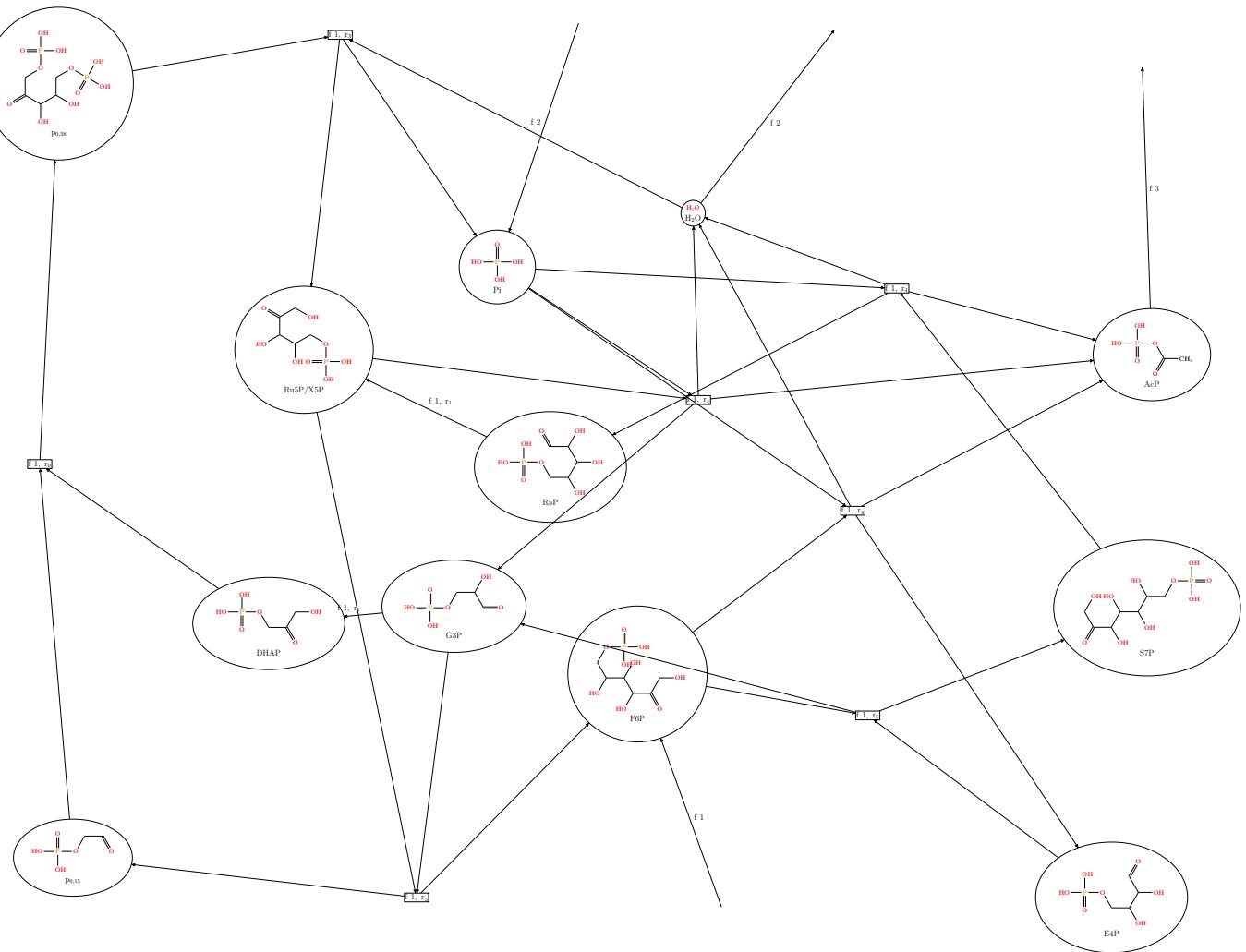
## Overall Data

Objective value (integral): 9

### Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/734\_dg\_0\_11100\_f\_0\_85\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.33 Solution 86

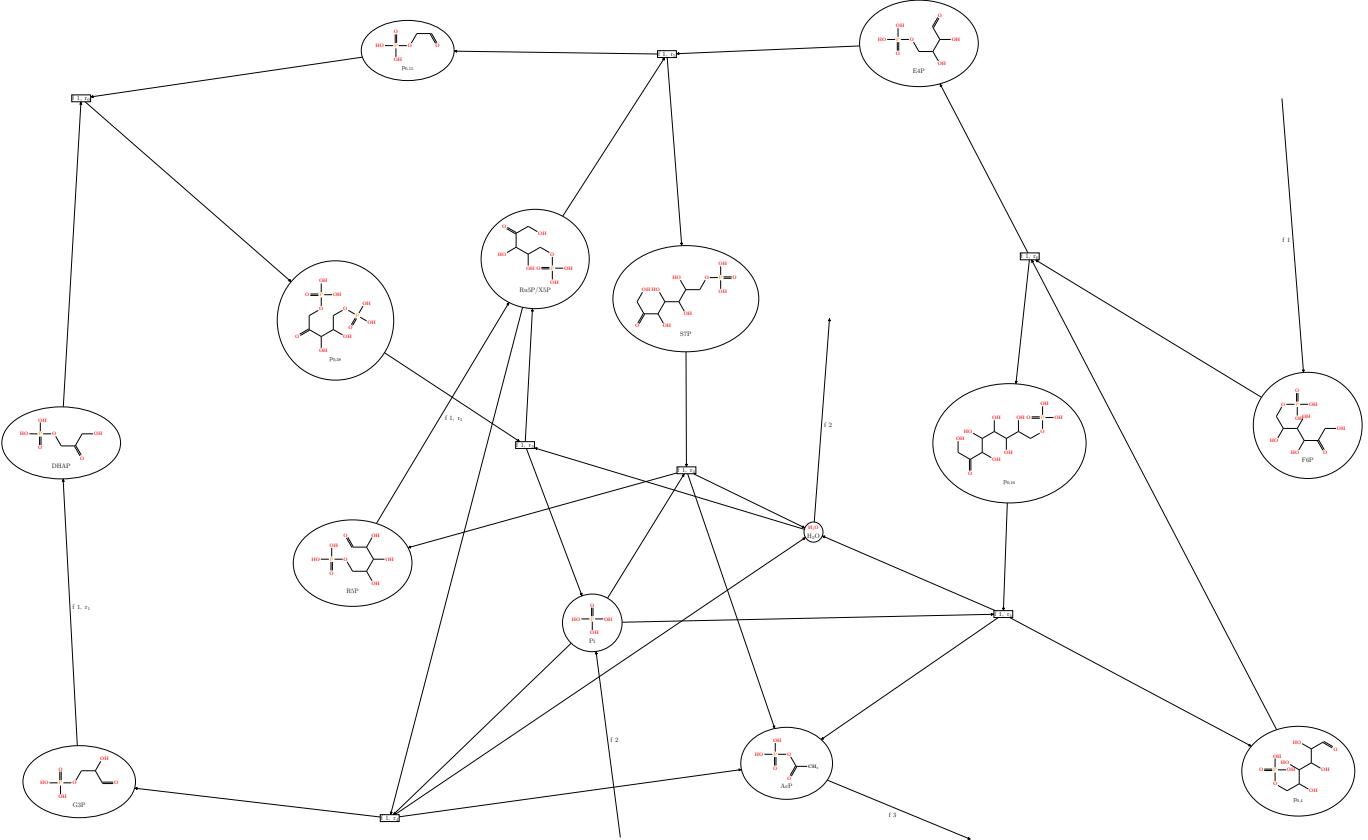
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/739\_dg\_0\_11100\_f\_0\_86\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.34 Solution 87

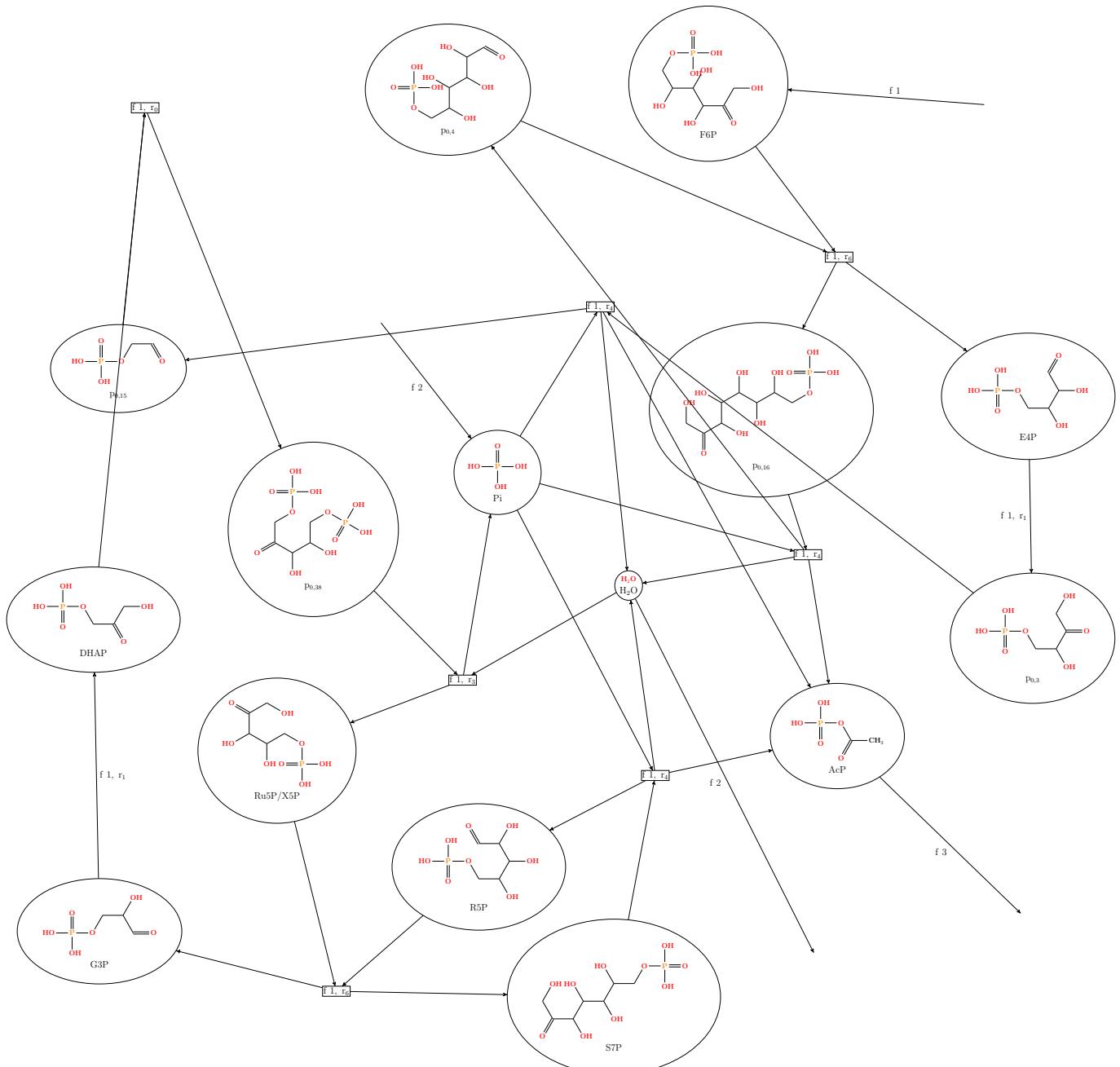
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/744\_dg\_0\_11100\_f\_0\_87\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.35 Solution 88

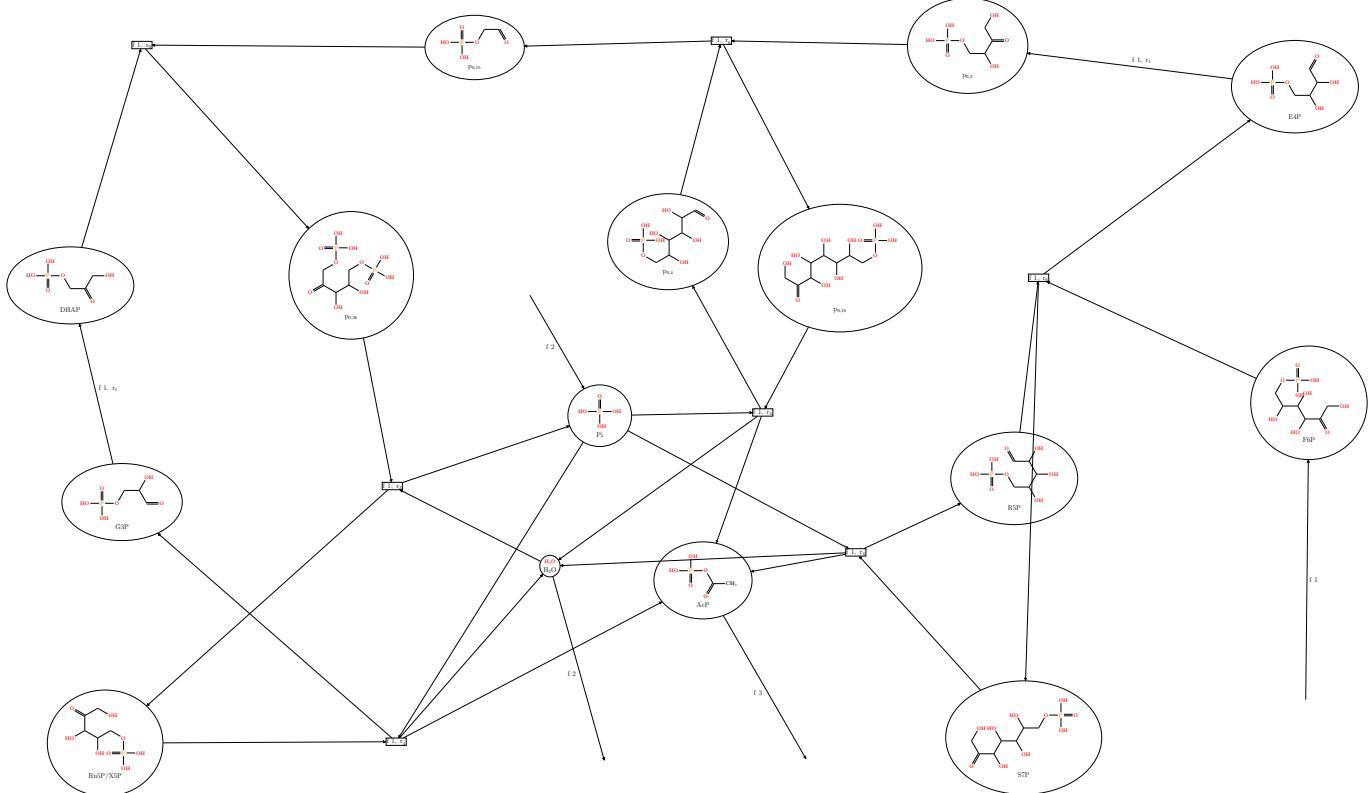
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/749\_dg\_0\_11100\_f\_0\_88\_filt

$$|E| = 9 \quad |P| = 9$$

0.18.36 Solution 94

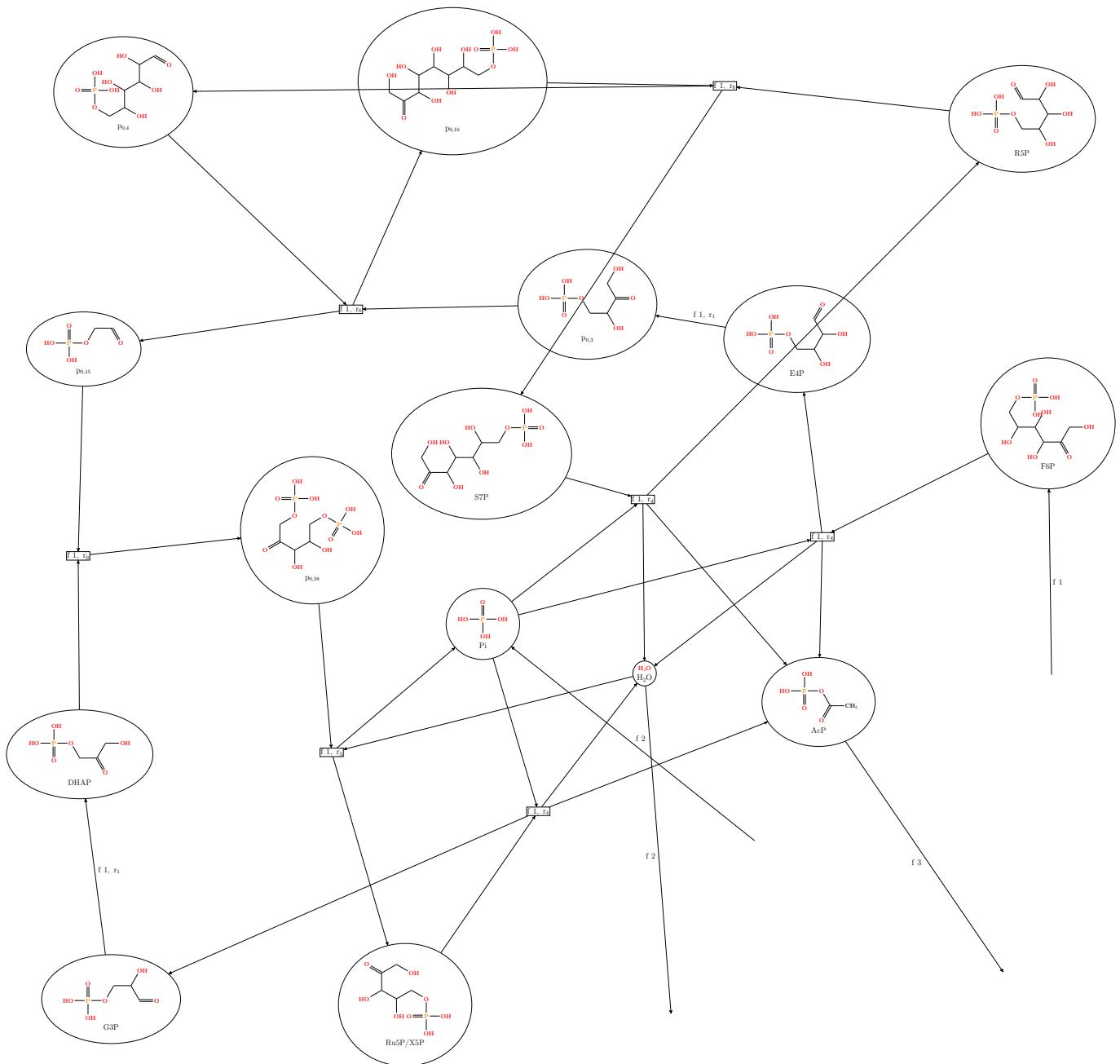
## Overall Data

Objective value (integral): 9

### Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_20	0	2
Pi	2	0

## Filtered Graph



File: out/754\_dg\_0\_11100\_f\_0\_94\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.37 Solution 95

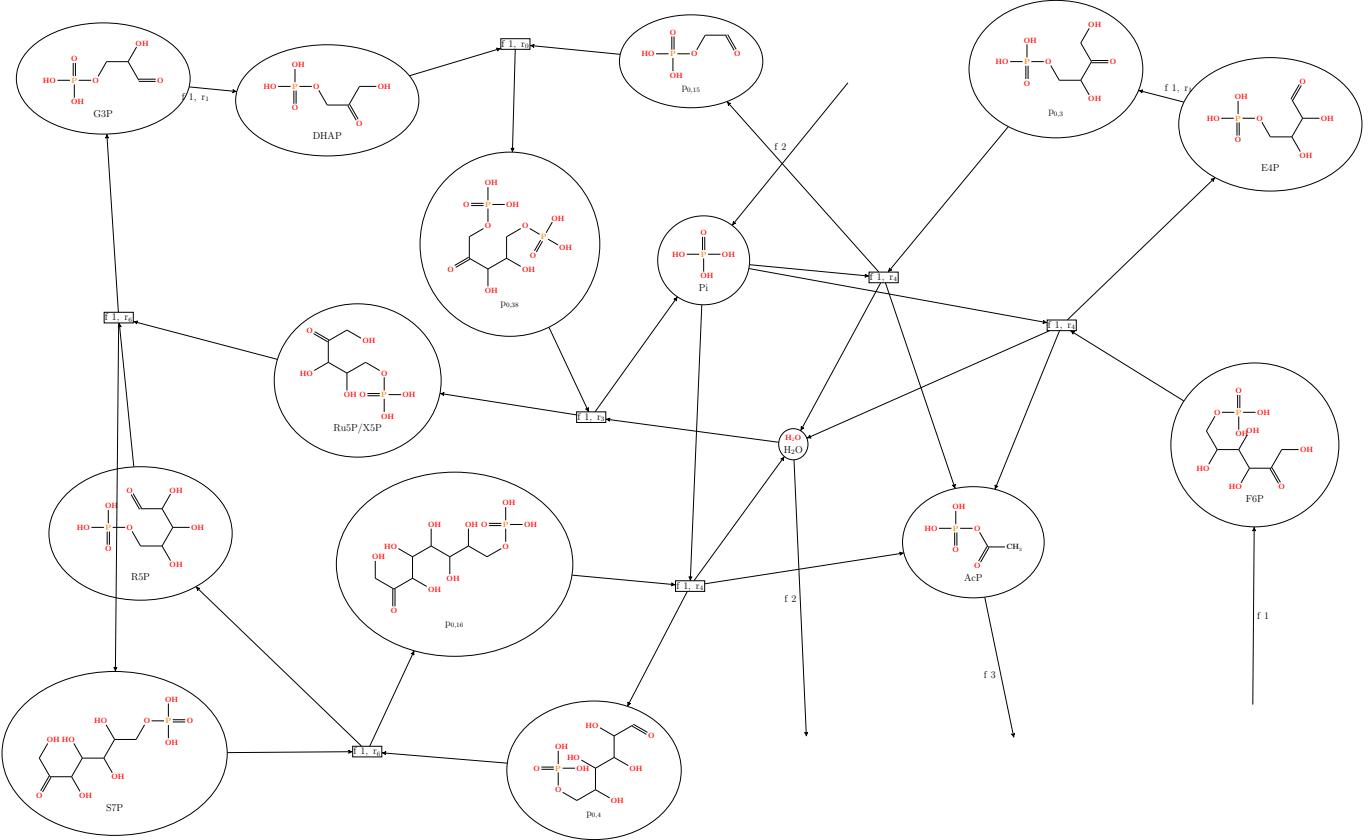
#### Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H <sub>2</sub> O	0	2
Pi	2	0

## Filtered Graph



File: out/759\_dg\_0\_11100\_f\_0\_95\_filt

$$|E| = 9 \quad |P| = 9$$

### 0.18.38 Solution 96

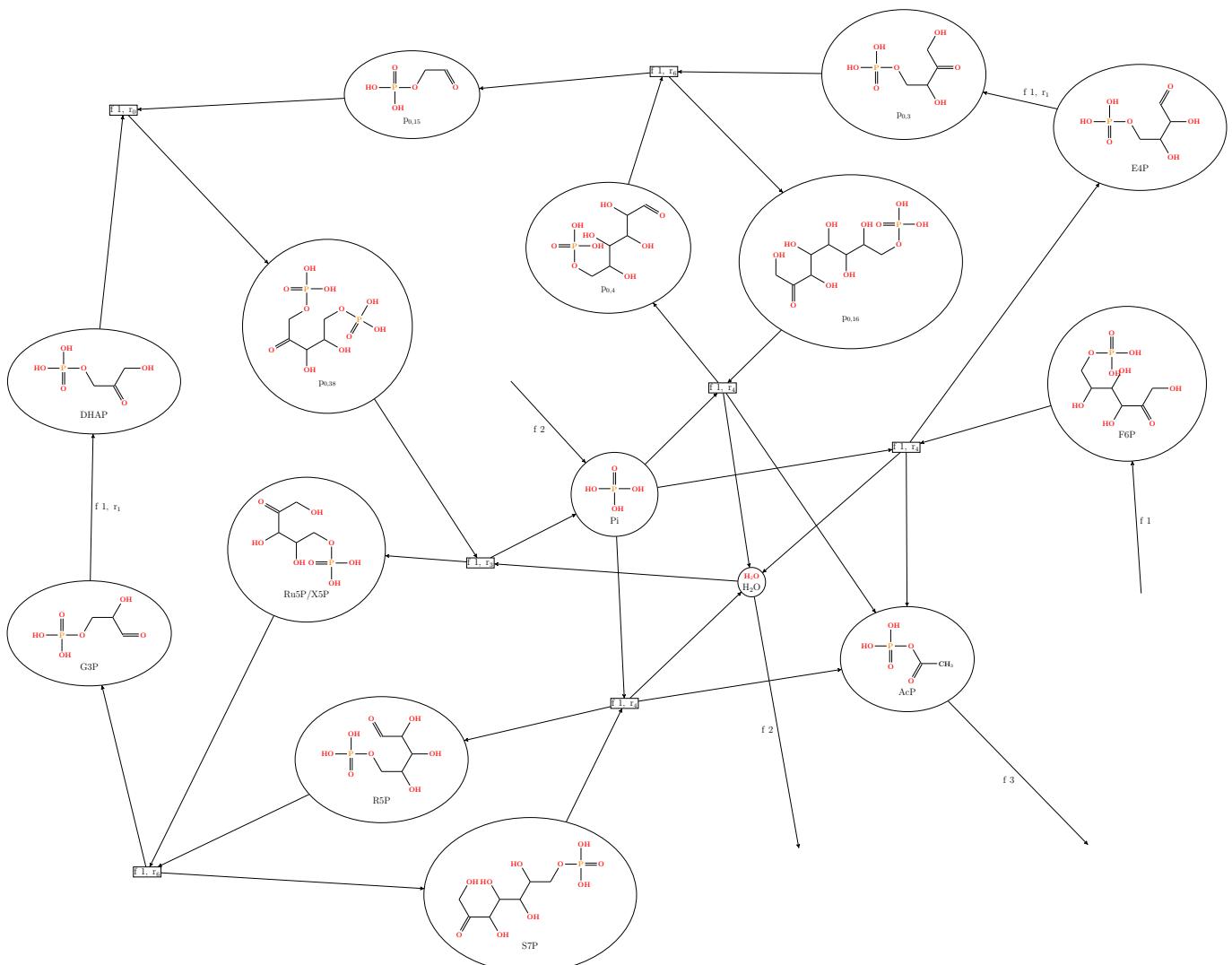
## Overall Data

Objective value (integral): 9

Vertex/Graph In Out

AcP	0	3
F6P	1	0
H_2O	0	2
Pi	2	0

## Filtered Graph



File: out/764\_dg\_0\_11100\_f\_0\_96\_filt

$$|E| = 9 \quad |P| = 9$$

## 0.19 Enumerated Flows with 10 unique reactions

## 0.20 Enumerated Flows with 11 unique reactions