Summary

December 6, 2024

Contents

0.1 Loaded Graphs

0.1.1 g_{0}

$$N \equiv C - H$$

File: `out/001_g_0_10300000`

$$N \equiv CH$$

File: `out/003_g_0_11310100`

0.1.2 g_{1}

$$\begin{array}{c} H \qquad\qquad H \\ \diagdown \qquad \diagup \\ N \\ | \\ H \end{array}$$

File: `out/005_g_1_10300000`

$$NH_3$$

File: `out/007_g_1_11310100`

0.1.3 g_{2}

$$\begin{array}{c} H \qquad\qquad H \\ \diagdown \qquad \diagup \\ O \end{array}$$

File: `out/009_g_2_10300000`
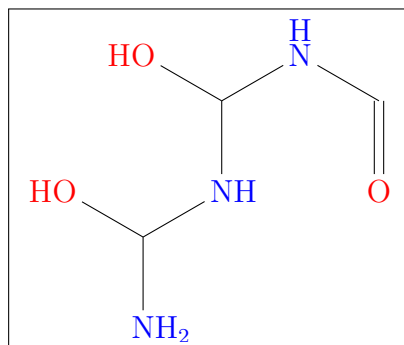
$$H_2O$$

File: `out/011_g_2_11310100`

0.2 Product Graphs

0.2.1 p_{0,56}

File: `out/013_g_1088_10300000`

File: `out/015_g_1088_11310100`

0.3 Enumerated Flows

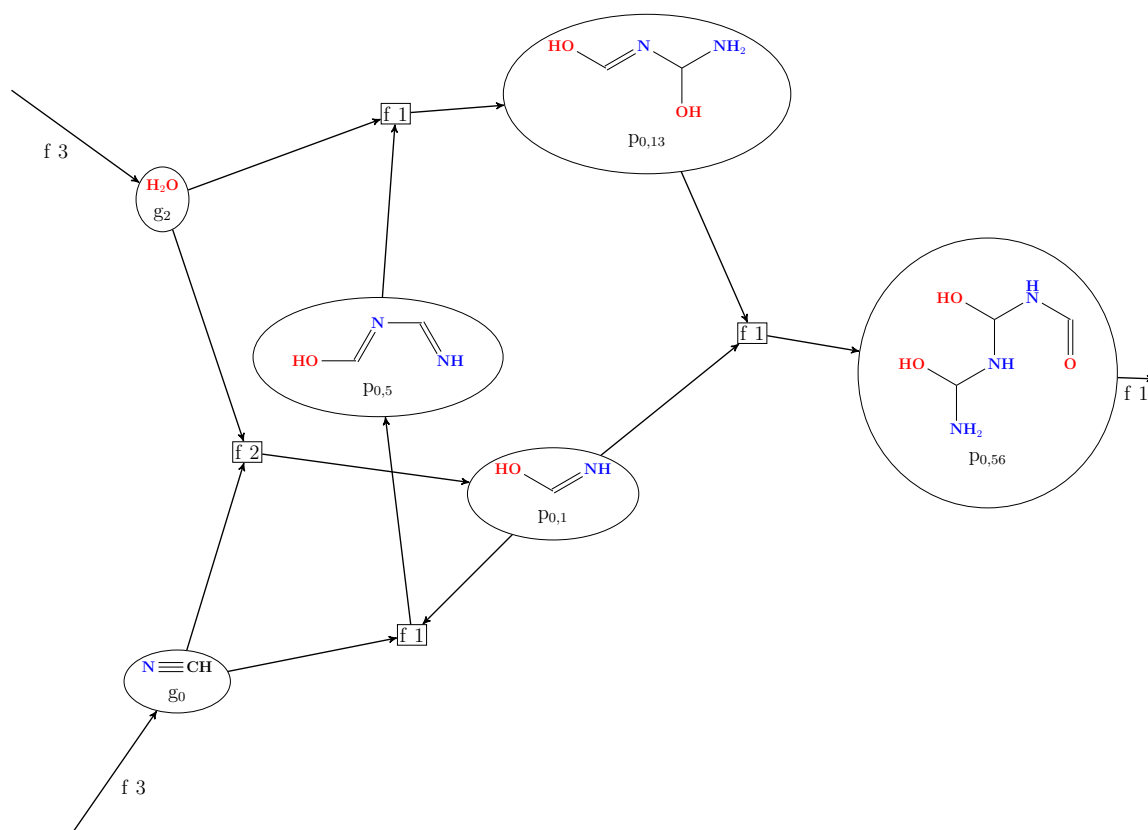### 0.3.1 Solution 0

Overall Data

```
Objective value (non-integral): -0.103196
Vertex/Graph In Out G          logK      t_order
g_{0}        3  0   -5.507152  -3.000000 0
g_{2}        3  0   -5.068033  -3.000000 0
p_{0,13}     0  0   -21.240635 -3.000000 65
p_{0,1}      0  0   -10.610080 -3.000000 1
p_{0,56}     0  1   -31.869324 -9.000000 67
p_{0,5}      0  0   -16.158998 -9.000000 64
```

Filtered Graph

File: `out/027_dg_0_11100_f_0_0_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-3.0	-14469.002933	0
g_2	3	0	-13306.118349	-3.0	-13316.095704	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	1
$p_{0,5}$	0	0	-42425.44262	-9.0	-42455.374686	64
$p_{0,13}$	0	0	-55767.279594	-3.0	-55777.256949	65
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-84.134398	-84.134398
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-117.138718	-117.138718
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-13.269576	-13.269576
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-56.340873	-56.340873
Sum					-270.941401308286

ΔG = -35.501795559977474
ΔE = -0.10319612969436476
|E| = 5
|U| = 4

0.3.2 Solution 1

Overall Data

```
Objective value (non-integral): -0.103196
Vertex/Graph In Out G          logK        t_order
g_{0}       3  0   -5.507152  -3.000000 0
g_{2}       3  0   -5.068043  -3.000000 0
p_{0,13}    0  0   -21.240678 -3.635441 33
p_{0,15}    0  0   -10.625195 -9.000000 33
p_{0,1}     0  0   -10.610101 -3.000000 31
p_{0,56}    0  1   -31.869324 -9.000000 67
p_{0,5}     0  0   -16.158998 -9.000000 32
```
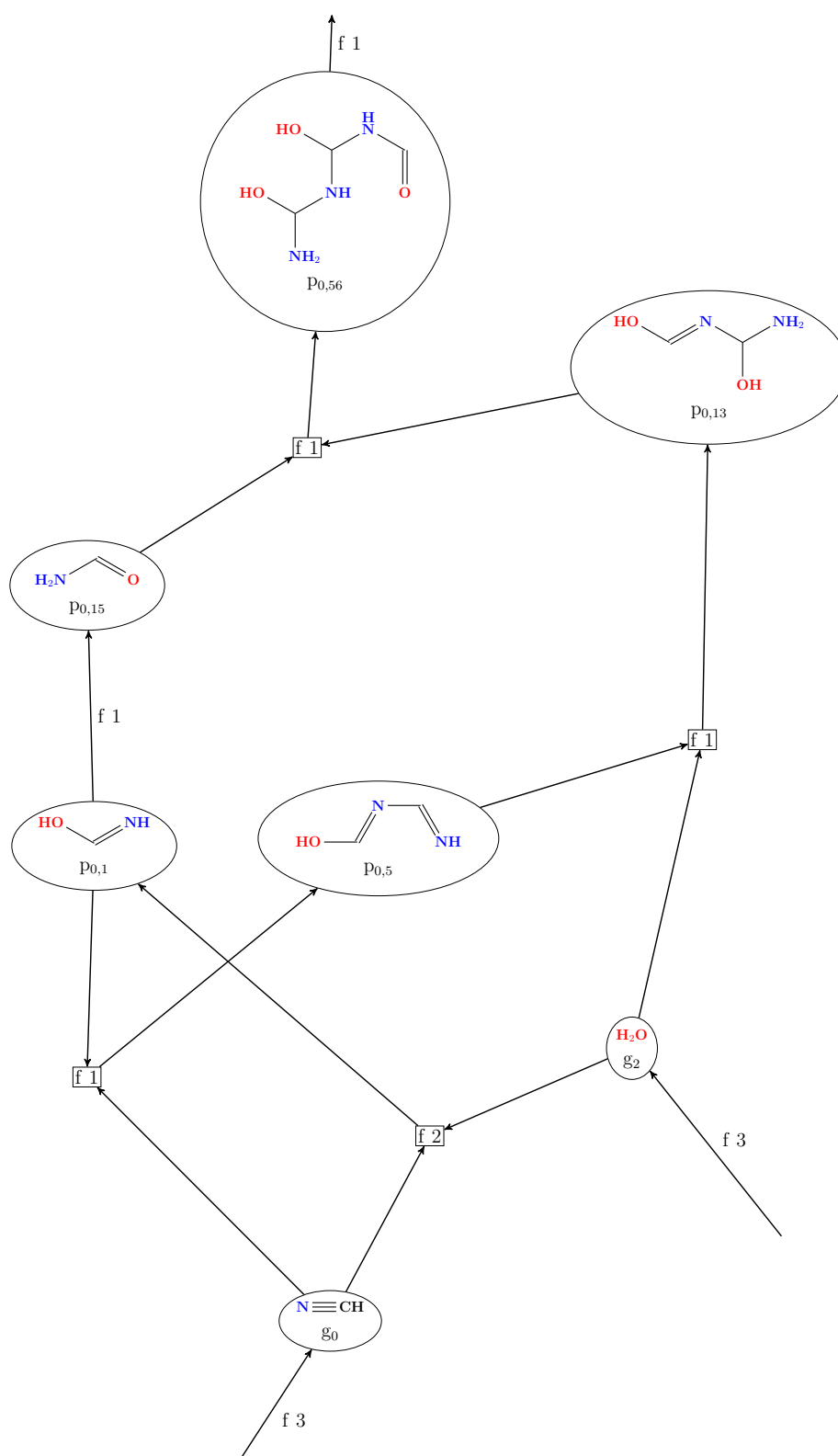
Filtered Graph

p_{0,56}

p_{0,13}

f 1

p_{0,15}

f 1

p_{0,1}

p_{0,5}

f 1

f 1

H_2O
g_2

f 1

f 2

f 3

N≡CH
g_0

f 3

File: `out/038_dg_0_11100_f_0_1_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-3.0	-14469.002933	0
g_2	3	0	-13306.144961	-3.0	-13316.122316	0
$p_{0,1}$	0	0	-27856.817054	-3.0	-27866.79441	31
$p_{0,5}$	0	0	-42425.44262	-9.0	-42455.374686	32
$p_{0,13}$	0	0	-55767.391129	-3.635441	-55779.481823	33
$p_{0,15}$	0	0	-27896.445756	-9.0	-27926.377821	33
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-84.163499	-84.163499
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-117.083005	-117.083005
36	$p_{0,1},$	$p_{0,15},$	1	-54.594734	-54.594734
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-14.939502	-14.939502
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-270.941401308287

ΔG = -35.493811940673744
ΔE = -0.10319612969436516
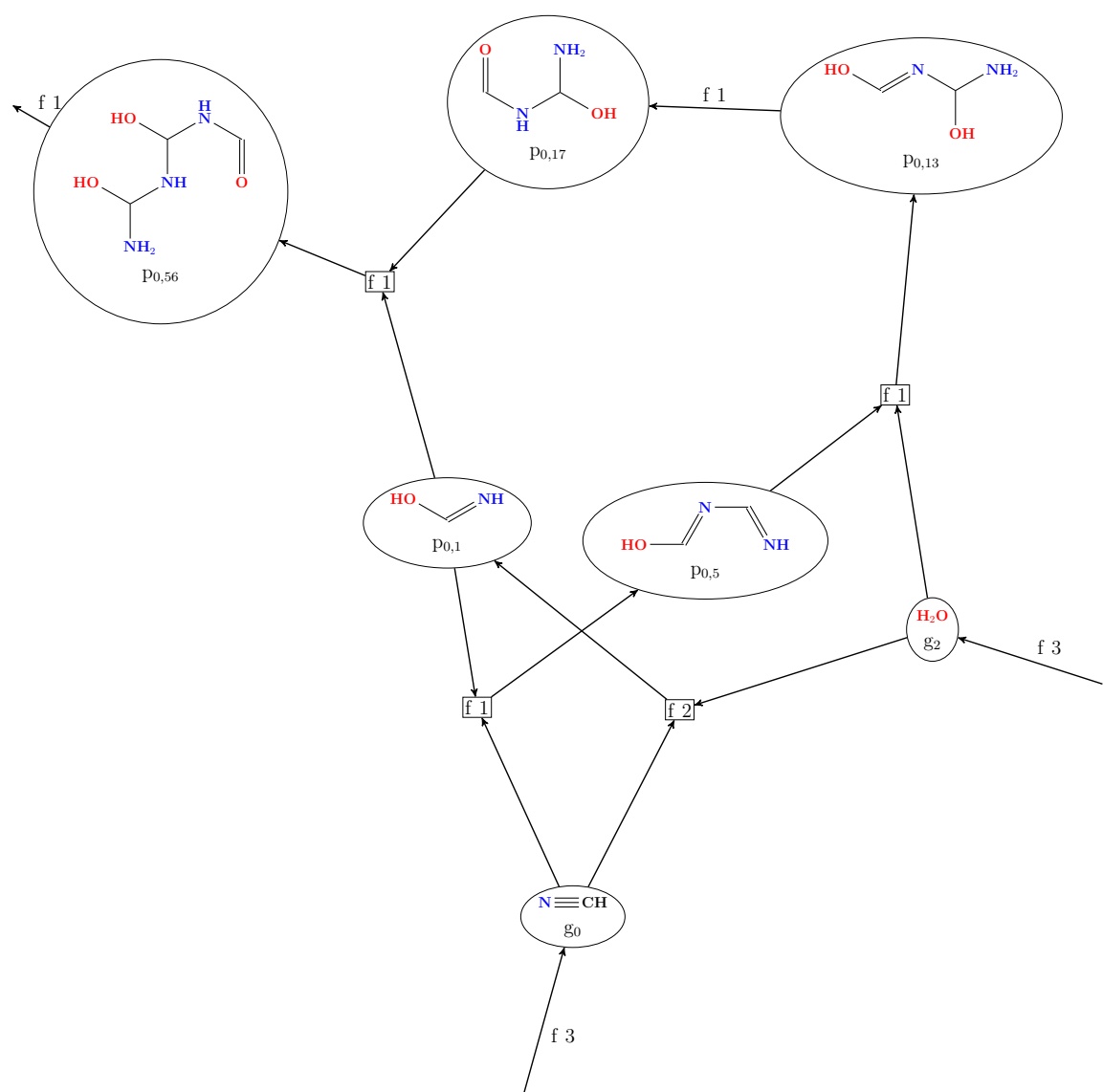|E| = 6
|U| = 5

0.3.3 Solution 2

Overall Data

```
Objective value (non-integral): -0.103196
Vertex/Graph In Out G          logK       t_order
g_{0}        3  0   -5.507152  -3.000000 0
g_{2}        3  0   -5.068033  -9.000000 0
p_{0,13}     0  0   -21.240678 -9.000000 3
p_{0,17}     0  0   -21.248887 -9.000000 65
p_{0,1}      0  0   -10.610101 -3.000000 1
p_{0,56}     0  1   -31.869324 -9.000000 67
p_{0,5}      0  0   -16.158998 -9.000000 2
```

Filtered Graph

File: `out/049_dg_0_11100_f_0_2_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-3.0	-14469.002933	0
g_2	3	0	-13306.118349	-9.0	-13336.050414	0
$p_{0,1}$	0	0	-27856.817054	-3.0	-27866.79441	1
$p_{0,5}$	0	0	-42425.44262	-9.0	-42455.374686	2
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	3
$p_{0,17}$	0	0	-55788.944315	-9.0	-55818.87638	65
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-69.224079	-69.224079
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-117.083005	-117.083005
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-13.381111	-13.381111
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-19.654406	-19.654406
250	$p_{0,13},$	$p_{0,17},$	1	-21.553186	-21.553186
Sum					-270.94140130828237

$\Delta G = $ -31.011985862394866
$\Delta E = $ -0.10319612969436338
$|\text{E}| = 6$
$|\text{U}| = 5$

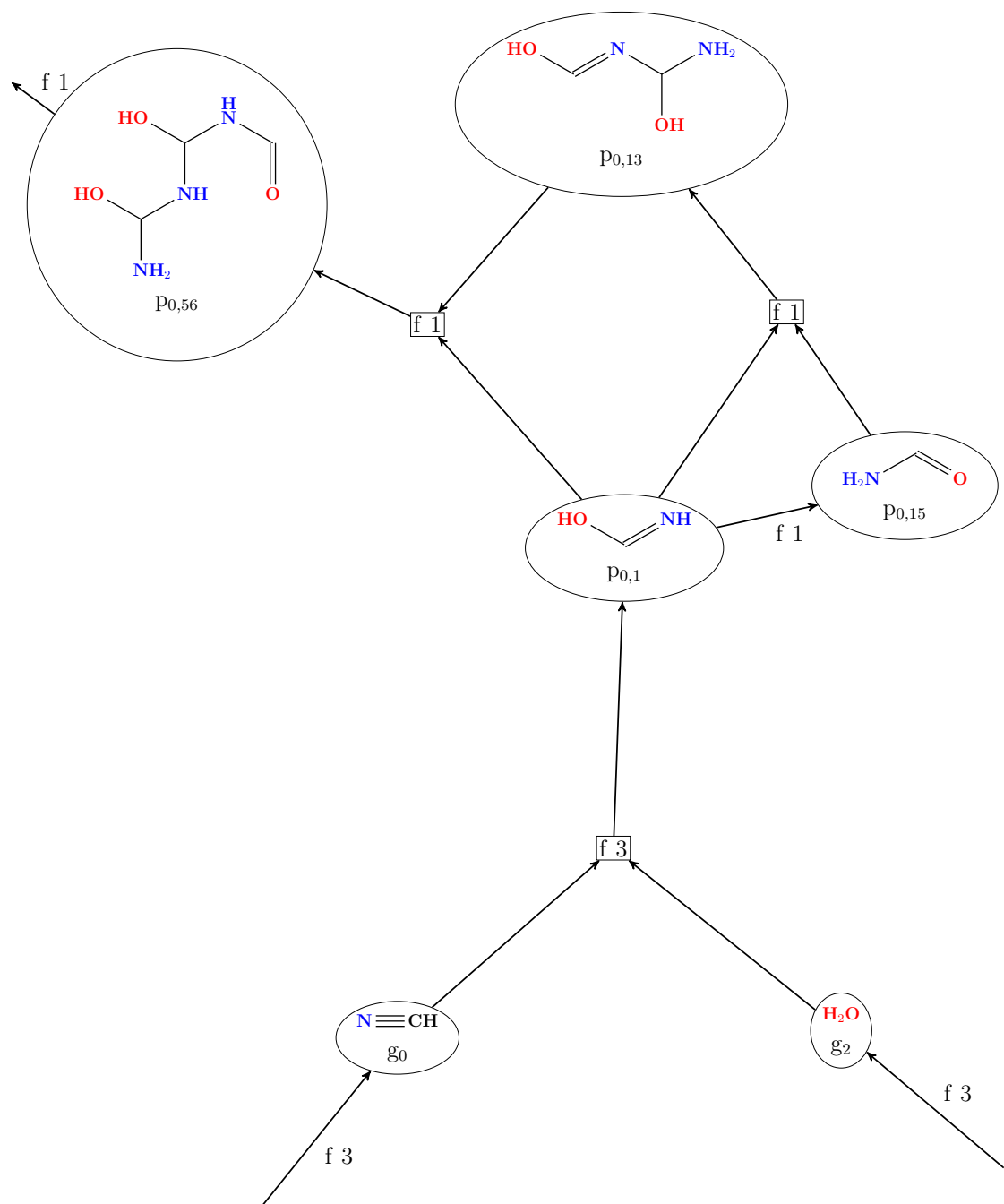### 0.3.4 Solution 3

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G          logK        t_order
g_{0}         3  0   -5.507152  -9.000000 0
g_{2}         3  0   -5.068043  -9.000000 0
p_{0,13}      0  0   -21.240678 -9.000000 65
p_{0,15}      0  0   -10.625174 -9.000000 32
p_{0,1}       0  0   -10.610101 -5.688972 1
p_{0,56}      0  1   -31.869260 -3.000000 67
```

Filtered Graph

File: `out/058_dg_0_11100_f_0_3_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-9.0	-14488.957643	0
g_2	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.817054	-5.688972	-27875.737354	1
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	65
$p_{0,15}$	0	0	-27896.389963	-9.0	-27926.322028	32
$p_{0,56}$	0	1	-83672.731446	-3.0	-83682.708802	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-60.938642	-60.938642
36	$p_{0,1},$	$p_{0,15},$	1	-47.831733	-47.831733
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	0.006113	0.006113
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-19.367006	-19.367006
Sum					-186.77808541741052

ΔG = -25.000854028212327

ΔE = -0.07114001564075756

|E| = 6

|U| = 4

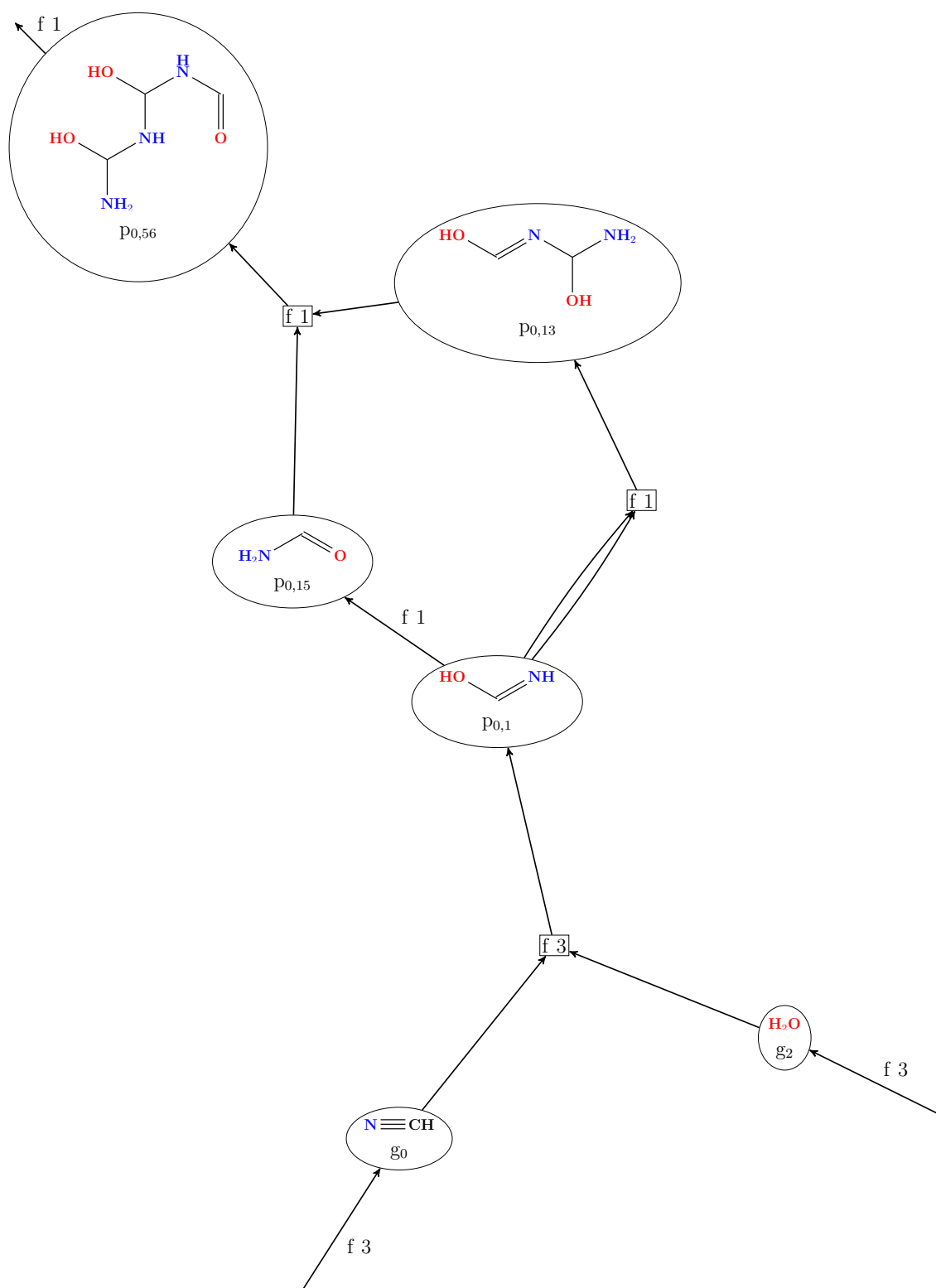### 0.3.5   Solution 4

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G          logK       t_order
g_{0}        3  0   -5.507152  -9.000000 0
g_{2}        3  0   -5.068033  -9.000000 0
p_{0,13}     0  0   -21.240678 -9.000000 3
p_{0,15}     0  0   -10.625195 -3.000000 63
p_{0,1}      0  0   -10.610101 -3.000000 1
p_{0,56}     0  1   -31.869324 -8.364559 67
```

Filtered Graph

f 1

HO   N—H

HO   NH

NH₂

O

$p_{0,56}$

HO   N   NH₂

OH

$p_{0,13}$

f 1

f 1

H₂N   O

$p_{0,15}$

f 1

HO   NH

$p_{0,1}$

f 1

f 3

H₂O

g_2

f 3

N≡CH

g_0

f 3

File: `out/067_dg_0_11100_f_0_4_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-9.0	-14488.957643	0
g_2	3	0	-13306.118349	-9.0	-13336.050414	0
$p_{0,1}$	0	0	-27856.817054	-3.0	-27866.79441	1
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	3
$p_{0,15}$	0	0	-27896.445756	-3.0	-27906.423111	63
$p_{0,56}$	0	1	-83672.898792	-8.364559	-83700.717519	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-54.258046	-54.258046
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-61.240036	-61.240036
36	$p_{0,1},$	$p_{0,15},$	1	-39.628701	-39.628701
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-186.77808541740794

ΔG = -26.363676064326672
ΔE = -0.07114001564075657
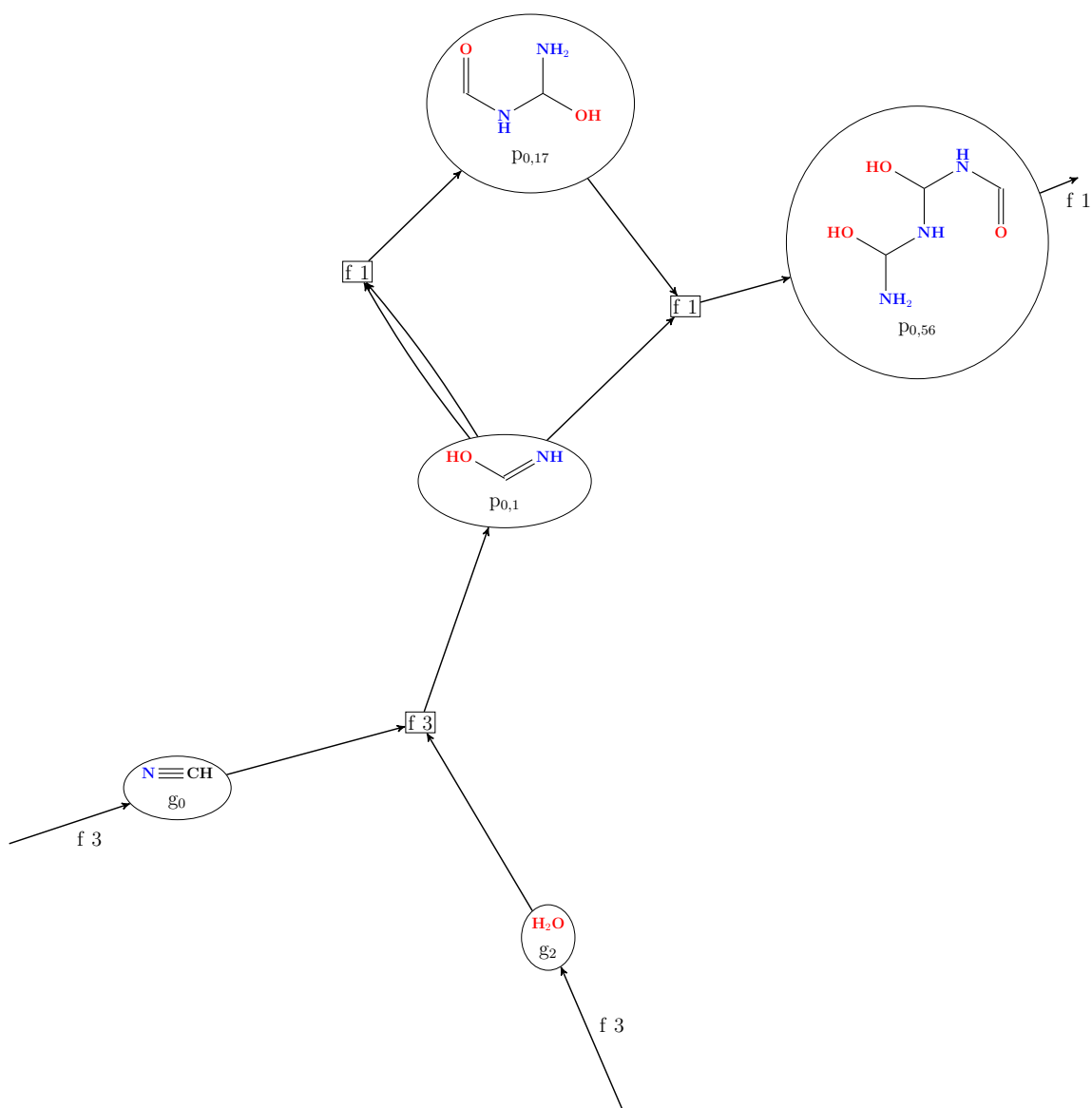|E| = 6
|U| = 4

0.3.6 Solution 5

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G          logK       t_order
g_{0}        3  0   -5.507152  -3.000000 0
g_{2}        3  0   -5.068043  -9.000000 0
p_{0,17}     0  0   -21.248844 -3.000000 45
p_{0,1}      0  0   -10.610080 -3.000000 21
p_{0,56}     0  1   -31.869324 -9.000000 67
```

Filtered Graph

File: `out/076_dg_0_11100_f_0_5_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-3.0	-14469.002933	0
g_2	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	21
$p_{0,17}$	0	0	-55788.832737	-3.0	-55798.810092	45
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-69.141753	-69.141753
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-67.827039	-67.827039
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-34.78773	-34.78773
Sum					-186.77808541740694

ΔG = -31.00400171799121

ΔE = -0.07114001564075619

|E| = 5
|U| = 3

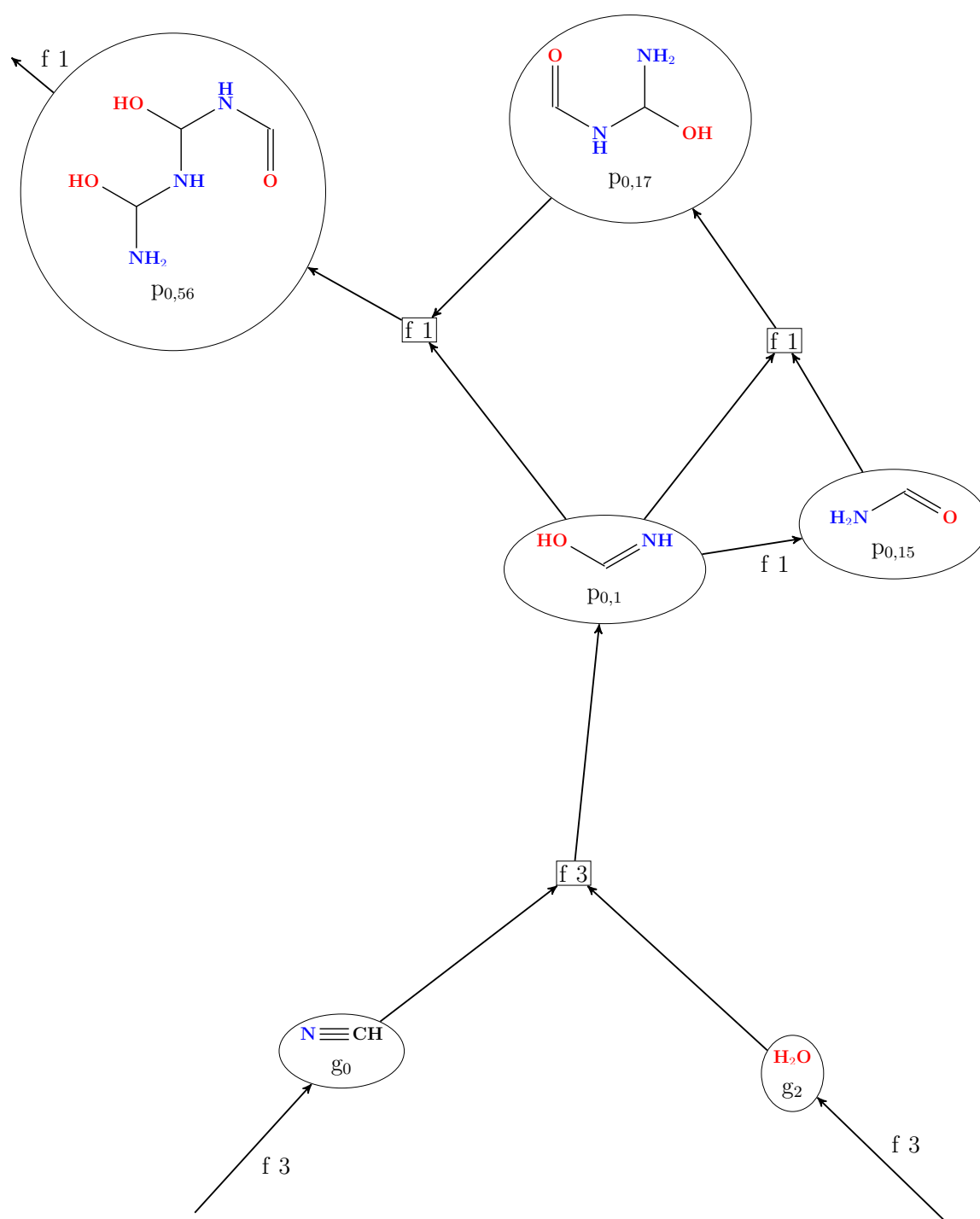### 0.3.7 Solution 6

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G            logK       t_order
g_{0}        3  0   -5.507152  -9.000000 0
g_{2}        3  0   -5.068043  -9.000000 0
p_{0,15}     0  0   -10.625195 -3.000000 22
p_{0,17}     0  0   -21.248844 -3.000000 44
p_{0,1}      0  0   -10.610080 -3.000000 21
p_{0,56}     0  1   -31.869324 -9.000000 67
```

Filtered Graph

File: `out/085_dg_0_11100_f_0_6_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-9.0	-14488.957643	0
g_2	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	21
$p_{0,15}$	0	0	-27896.445756	-3.0	-27906.423111	22
$p_{0,17}$	0	0	-55788.832737	-3.0	-55798.810092	44
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-54.17572	-54.17572
36	$p_{0,1},$	$p_{0,15},$	1	-39.684415	-39.684415
183	$p_{0,1}, p_{0,15},$	$p_{0,17},$	1	-28.142624	-28.142624
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-34.78773	-34.78773
Sum					-186.77808541740794

$\Delta G = -26.51419254550853$

$\Delta E = -0.07114001564075657$
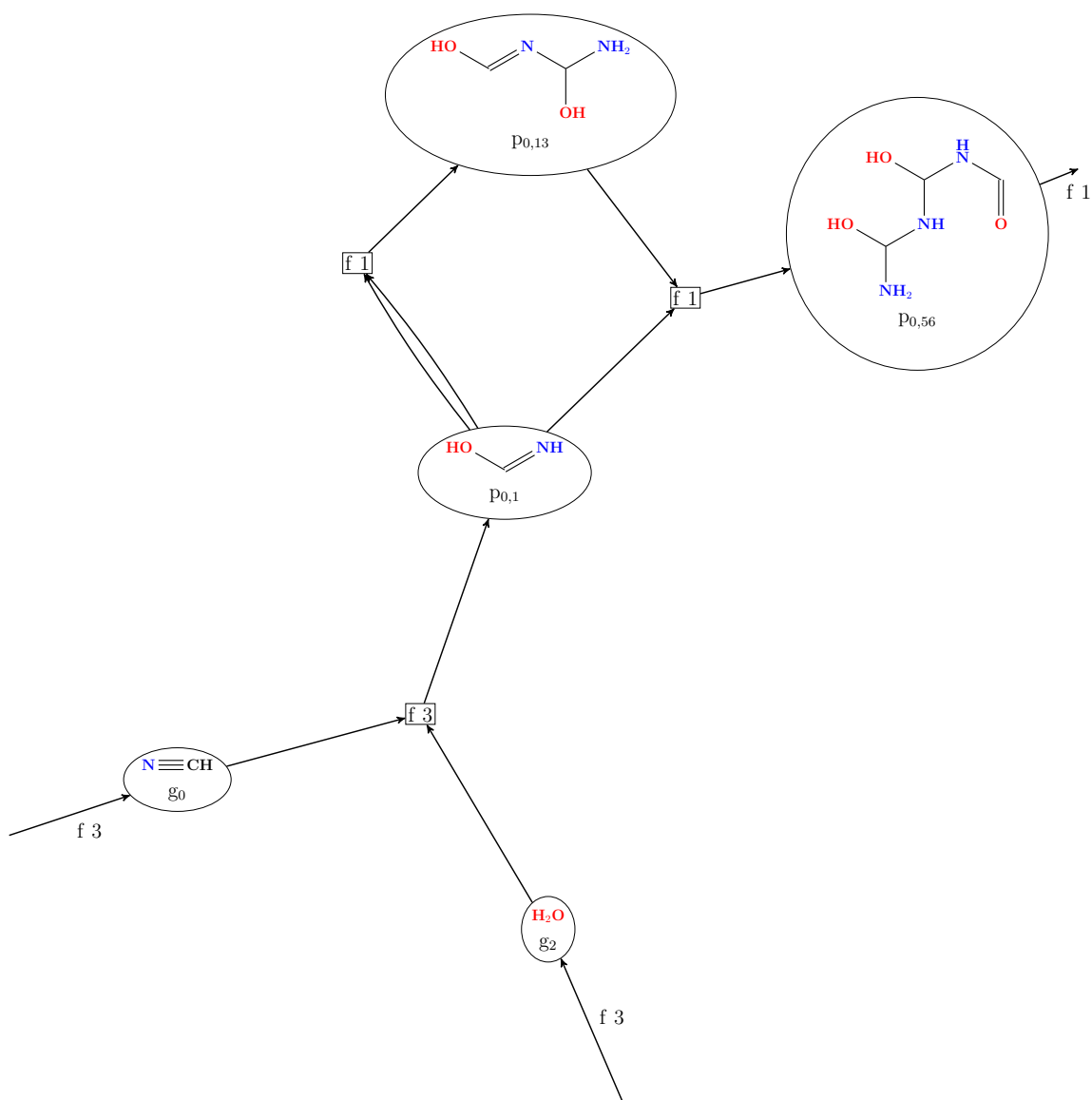
$|E| = 6$

$|U| = 4$

0.3.8 Solution 7

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G          logK       t_order
g_{0}        3  0   -5.507152  -9.000000 0
g_{2}        3  0   -5.068033  -9.000000 0
p_{0,13}     0  0   -21.240635 -3.000000 3
p_{0,1}      0  0   -10.610080 -3.000000 1
p_{0,56}     0  1   -31.869324 -9.000000 67
```

Filtered Graph

File: `out/094_dg_0_11100_f_0_7_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-9.0	-14488.957643	0
g_2	3	0	-13306.118349	-9.0	-13336.050414	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	1
$p_{0,13}$	0	0	-55767.279594	-3.0	-55777.256949	3
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-54.202332	-54.202332
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-46.273896	-46.273896
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-56.340873	-56.340873
Sum					-186.77808541740688

ΔG = -26.522176427362222

ΔE = -0.07114001564075617

|E| = 5
|U| = 3

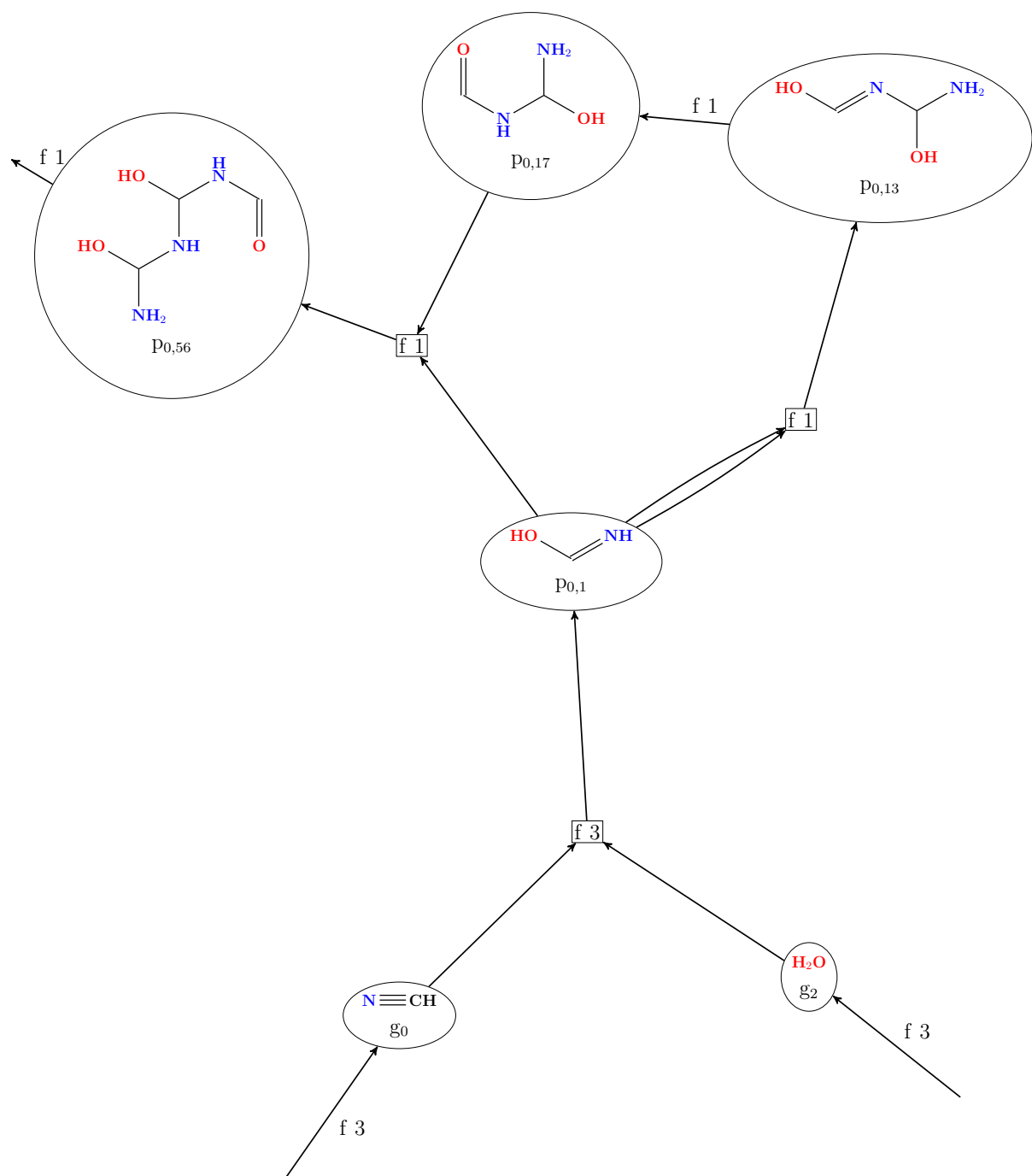## 0.3.9   Solution 8

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G             logK       t_order
g_{0}         3   0   -5.507152  -9.000000 0
g_{2}         3   0   -5.068033  -9.000000 20
p_{0,13}      0   0   -21.240635 -3.000000 43
p_{0,17}      0   0   -21.248844 -3.000000 45
p_{0,1}       0   0   -10.610080 -3.000000 21
p_{0,56}      0   1   -31.869324 -9.000000 67
```

Filtered Graph

File: `out/103_dg_0_11100_f_0_8_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-9.0	-14488.957643	0
g_2	3	0	-13306.118349	-9.0	-13336.050414	20
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	21
$p_{0,13}$	0	0	-55767.279594	-3.0	-55777.256949	43
$p_{0,17}$	0	0	-55788.832737	-3.0	-55798.810092	45
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-54.202332	-54.202332
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-46.273896	-46.273896
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-34.78773	-34.78773
250	$p_{0,13},$	$p_{0,17},$	1	-21.553143	-21.553143
Sum					-186.77808541740532

ΔG = -26.522176164812258
ΔE = -0.07114001564075557
|E| = 6
|U| = 4

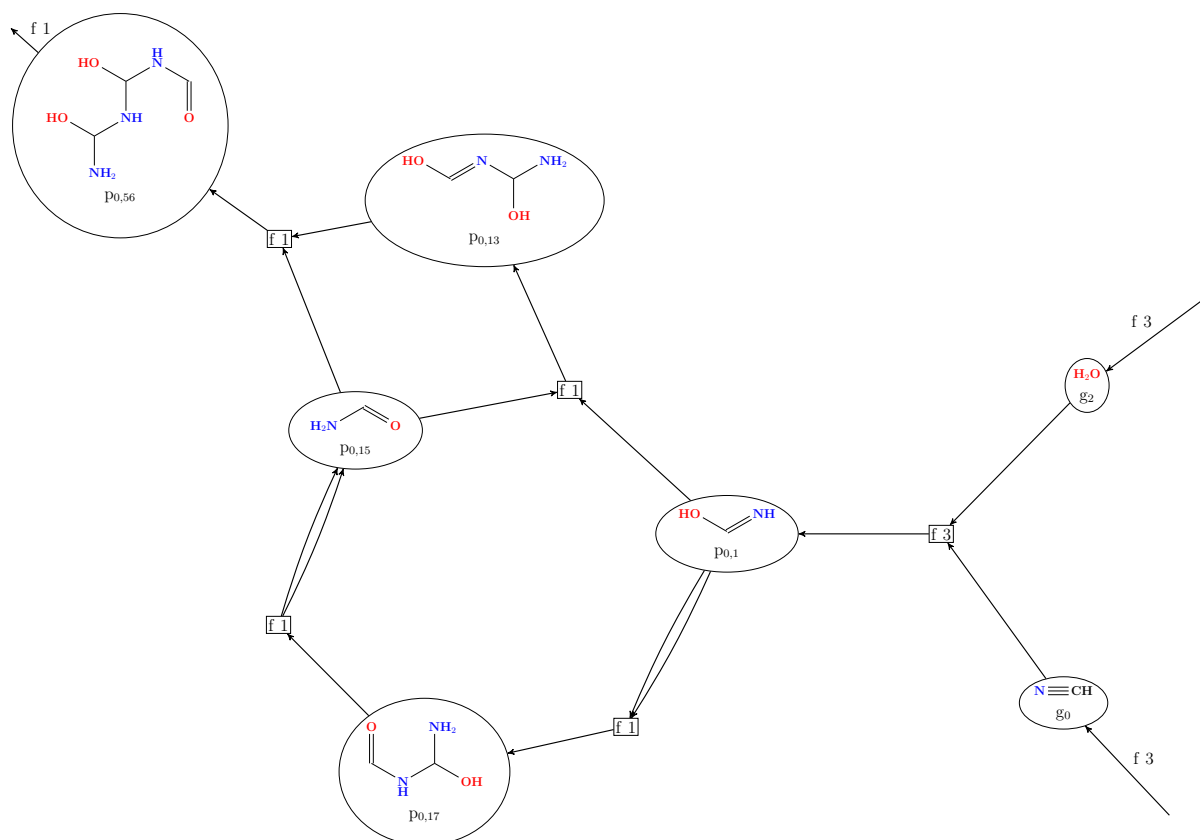## 0.3.10 Solution 9

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G          logK      t_order
g_{0}        3  0   -5.507152  -3.000000 0
g_{2}        3  0   -5.068043  -3.000000 0
p_{0,13}     0  0   -21.240678 -4.973250 40
p_{0,15}     0  0   -10.625174 -7.684558 26
p_{0,17}     0  0   -21.248887 -9.000000 25
p_{0,1}      0  0   -10.610080 -3.000000 12
p_{0,56}     0  1   -31.869324 -9.000000 67
```

Filtered Graph

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-3.0	-14469.002933	0
g_2	3	0	-13306.144961	-3.0	-13316.122316	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	12
$p_{0,13}$	0	0	-55767.391129	-4.97325	-55783.931089	40
$p_{0,15}$	0	0	-27896.389963	-7.684558	-27921.947152	26
$p_{0,17}$	0	0	-55788.944315	-9.0	-55818.87638	25
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-84.107786	-84.107786
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-82.90465	-82.90465
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	0.006113	0.006113
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	0.006113	0.006113
237	$p_{0,17},$	$p_{0,15}, p_{0,15},$	1	-19.722346	-19.722346
Sum					-186.7780854174049

ΔG = -35.493811940673744

ΔE = -0.07114001564075541

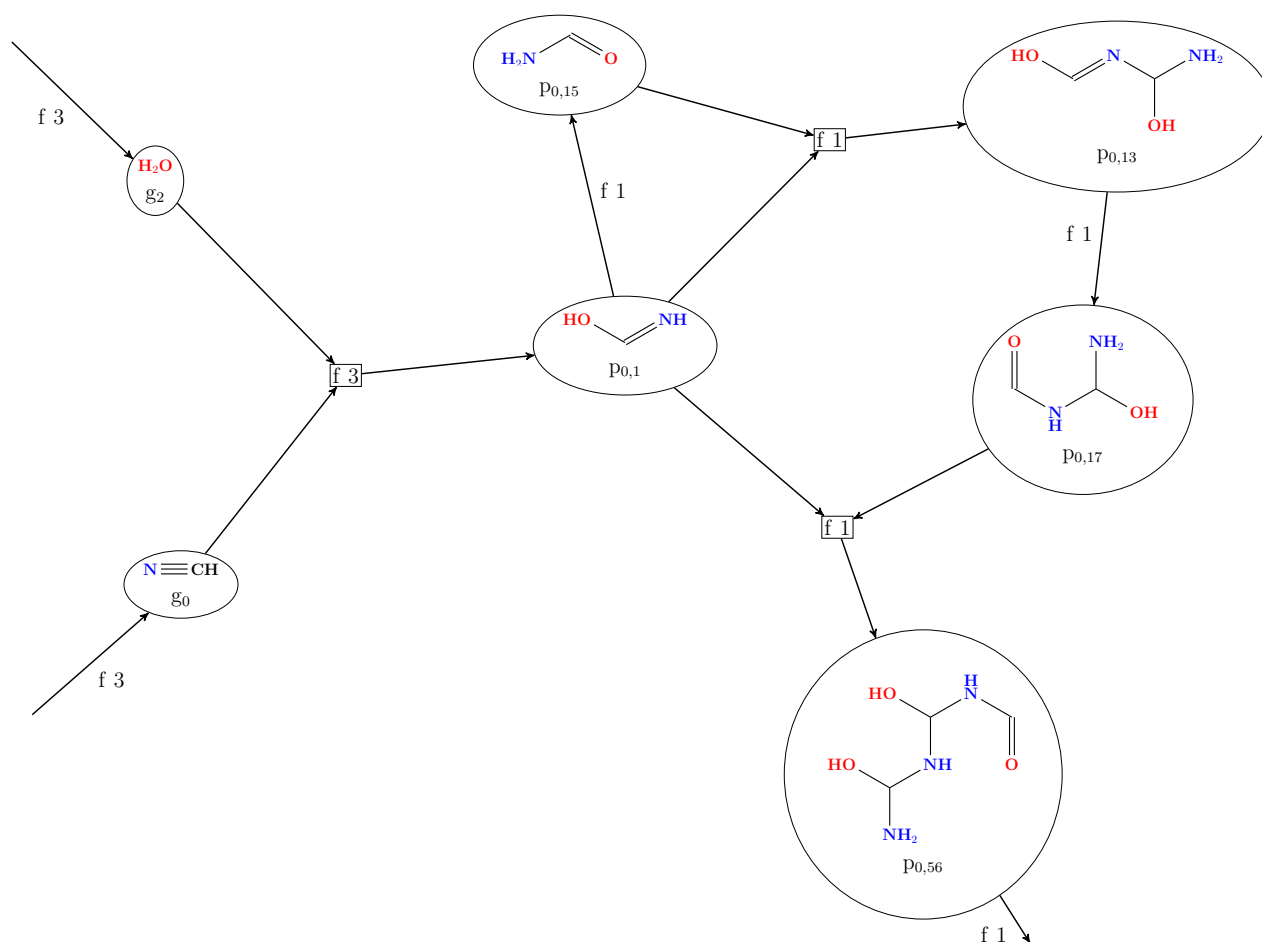|E| = 7

|U| = 5

0.3.11   Solution 10

Overall Data

```
Objective value (non-integral): -0.07114
Vertex/Graph In Out G          logK       t_order
g_{0}        3  0   -5.507152  -9.000000 0
g_{2}        3  0   -5.068043  -9.000000 0
p_{0,13}     0  0   -21.240635 -3.000000 64
p_{0,15}     0  0   -10.625195 -3.000000 62
p_{0,17}     0  0   -21.248887 -3.000000 65
p_{0,1}      0  0   -10.610080 -3.000000 1
p_{0,56}     0  1   -31.869324 -9.000000 67
```

Filtered Graph

File: `out/121_dg_0_11100_f_0_10_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-9.0	-14488.957643	0
g_2	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	1
$p_{0,13}$	0	0	-55767.279594	-3.0	-55777.256949	64
$p_{0,15}$	0	0	-27896.445756	-3.0	-27906.423111	62
$p_{0,17}$	0	0	-55788.944315	-3.0	-55798.92167	65
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-54.17572	-54.17572
36	$p_{0,1},$	$p_{0,15},$	1	-39.684415	-39.684415
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-6.589481	-6.589481
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-34.676153	-34.676153
250	$p_{0,13},$	$p_{0,17},$	1	-21.664721	-21.664721
Sum					-186.77808541740225

ΔG = -26.51419254550853

ΔE = -0.07114001564075441
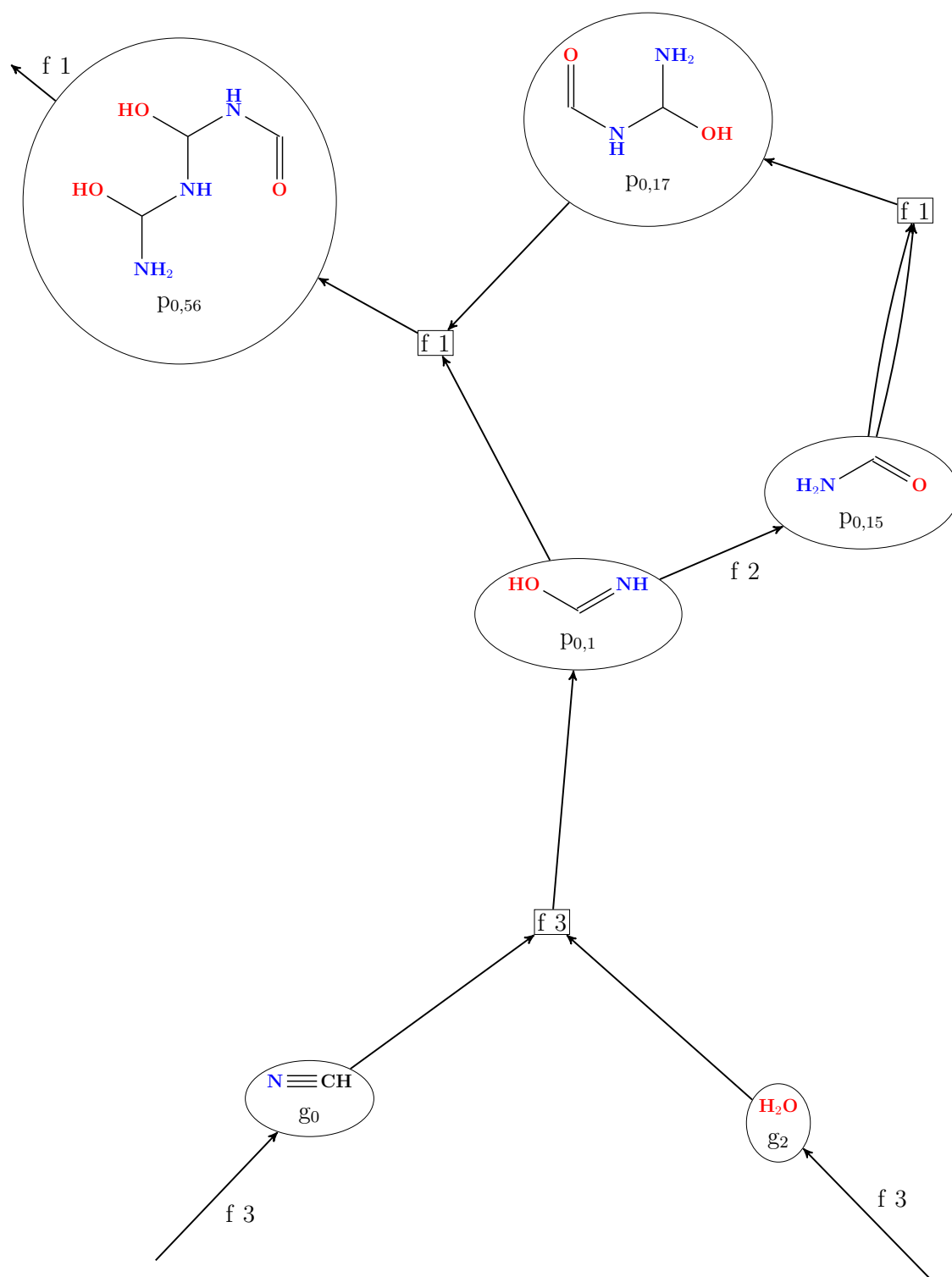
|E| = 7
|U| = 5

0.3.12 Solution 11

Overall Data

```
Objective value (non-integral): -0.0560463
Vertex/Graph In Out G          logK       t_order
g_{0}        3   0   -5.507152  -3.000000 0
g_{2}        3   0   -5.068043  -3.000000 0
p_{0,15}     0   0   -10.625174 -3.000000 2
p_{0,17}     0   0   -21.248844 -7.582459 5
p_{0,1}      0   0   -10.610080 -3.000000 1
p_{0,56}     0   1   -31.869324 -9.000000 67
```

Filtered Graph

f 1

HO — N(H) — O

HO — NH

NH_2

$p_{0,56}$

O — NH_2

N(H) — OH

$p_{0,17}$

f 1

H_2N — O

$p_{0,15}$

HO — NH

$p_{0,1}$

f 2

f 1

f 3

N≡CH

g_0

H_2O

g_2

f 3

f 3

File: `out/130_dg_0_11100_f_0_11_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-3.0	-14469.002933	0
g_2	3	0	-13306.144961	-3.0	-13316.122316	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	1
$p_{0,15}$	0	0	-27896.389963	-3.0	-27906.367318	2
$p_{0,17}$	0	0	-55788.832737	-7.582459	-55814.050366	5
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-84.107786	-84.107786
36	$p_{0,1},$	$p_{0,15},$	2	-39.628622	-39.628622
180	$p_{0,15}, p_{0,15},$	$p_{0,17},$	1	0.0	0.0
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-23.357525	-23.357525
Sum					-147.14946331361645

ΔG = -35.493811940673744
ΔE = -0.05604627062251683
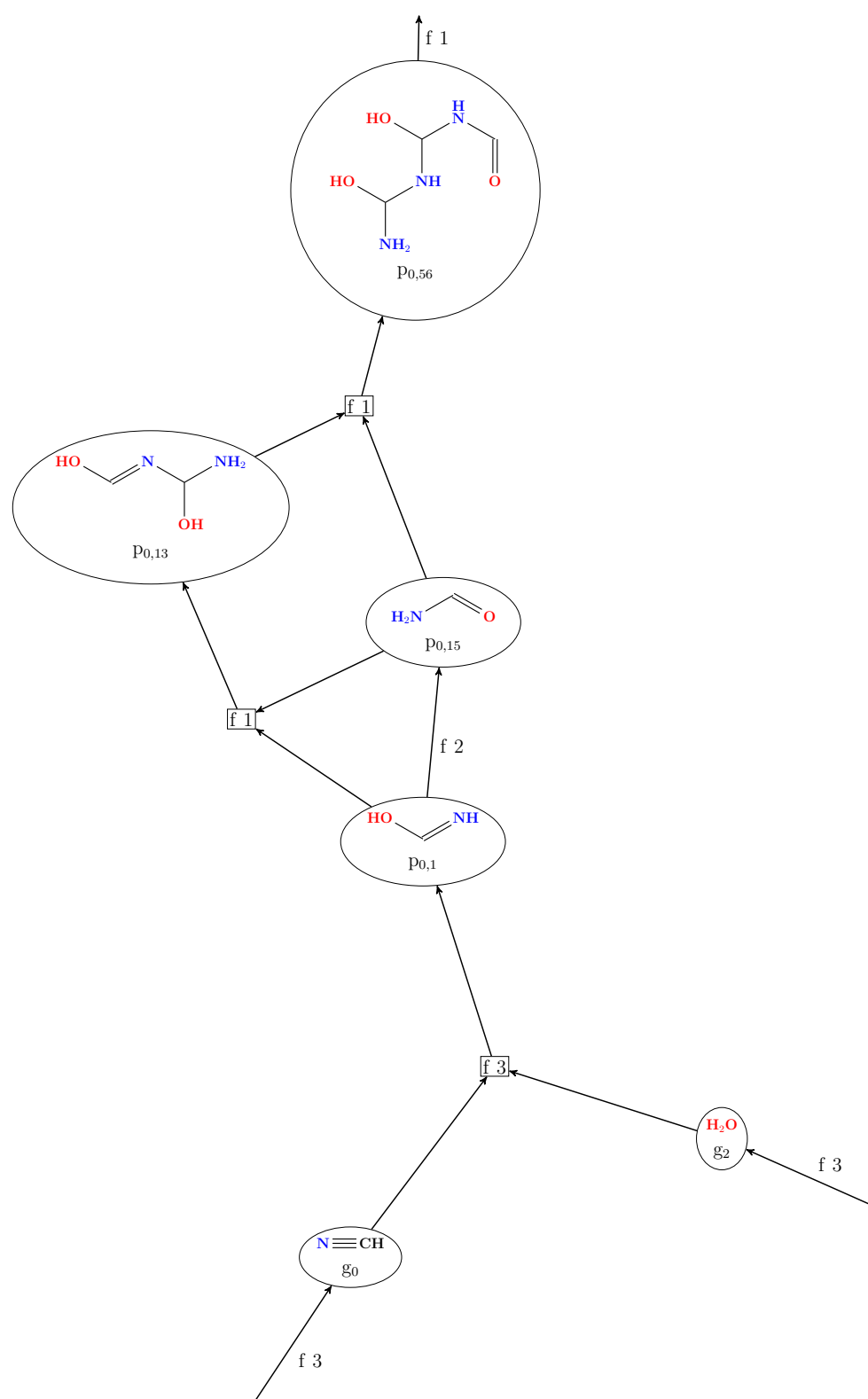|E| = 7
|U| = 4

0.3.13 Solution 12

Overall Data

```
Objective value (non-integral): -0.0560463
Vertex/Graph In Out G          logK       t_order
g_{0}         3   0  -5.507152  -3.000000 0
g_{2}         3   0  -5.068043  -3.000000 0
p_{0,13}      0   0  -21.240678 -9.000000 64
p_{0,15}      0   0  -10.625174 -3.000000 2
p_{0,1}       0   0  -10.610080 -3.000000 1
p_{0,56}      0   1  -31.869324 -9.000000 67
```

Filtered Graph

File: `out/139_dg_0_11100_f_0_12_filt`

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	x_v^K	$x_v^{\Delta G}$	t_v
g_0	3	0	-14459.025578	-3.0	-14469.002933	0
g_2	3	0	-13306.144961	-3.0	-13316.122316	0
$p_{0,1}$	0	0	-27856.761341	-3.0	-27866.738696	1
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	64
$p_{0,15}$	0	0	-27896.389963	-3.0	-27906.367318	2
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\overline{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-84.107786	-84.107786
36	$p_{0,1},$	$p_{0,15},$	2	-39.628622	-39.628622
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	-1.634684	-1.634684
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-21.722842	-21.722842
Sum					-147.14946331361077

ΔG = -35.493811940673744
ΔE = -0.05604627062251467
|E| = 7
|U| = 4