

# Summary

December 7, 2024

# Contents

0.1	Loaded Graphs . . . . .	2
0.1.1	$g_{\{0\}}$ . . . . .	2
0.1.2	$g_{\{1\}}$ . . . . .	2
0.1.3	$g_{\{2\}}$ . . . . .	2
0.2	Product Graphs . . . . .	2
0.2.1	$p_{\{0,56\}}$ . . . . .	2
0.3	Enumerated Flows . . . . .	3
0.3.1	Solution 0 . . . . .	3
0.3.2	Solution 1 . . . . .	5
0.3.3	Solution 2 . . . . .	7
0.3.4	Solution 3 . . . . .	9
0.3.5	Solution 4 . . . . .	10
0.3.6	Solution 5 . . . . .	12
0.3.7	Solution 6 . . . . .	14
0.3.8	Solution 7 . . . . .	16
0.3.9	Solution 8 . . . . .	18
0.3.10	Solution 9 . . . . .	19
0.3.11	Solution 10 . . . . .	21
0.3.12	Solution 11 . . . . .	22
0.3.13	Solution 12 . . . . .	24
0.3.14	Solution 13 . . . . .	26
0.3.15	Solution 14 . . . . .	28
0.3.16	Solution 15 . . . . .	30
0.3.17	Solution 16 . . . . .	32
0.3.18	Solution 17 . . . . .	33
0.3.19	Solution 18 . . . . .	36
0.3.20	Solution 19 . . . . .	38

## 0.1 Loaded Graphs

### 0.1.1 g\_{0}



File: out/001\_g\_0\_10300000



File: out/003\_g\_0\_11310100

### 0.1.2 g\_{1}



File: out/005\_g\_1\_10300000



File: out/007\_g\_1\_11310100

### 0.1.3 g\_{2}



File: out/009\_g\_2\_10300000



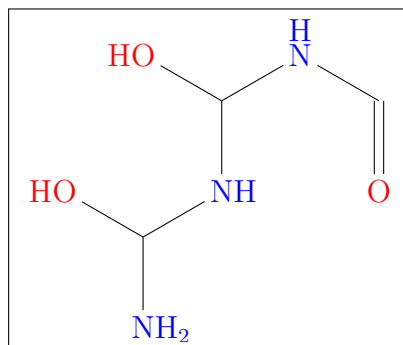
File: out/011\_g\_2\_11310100

## 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

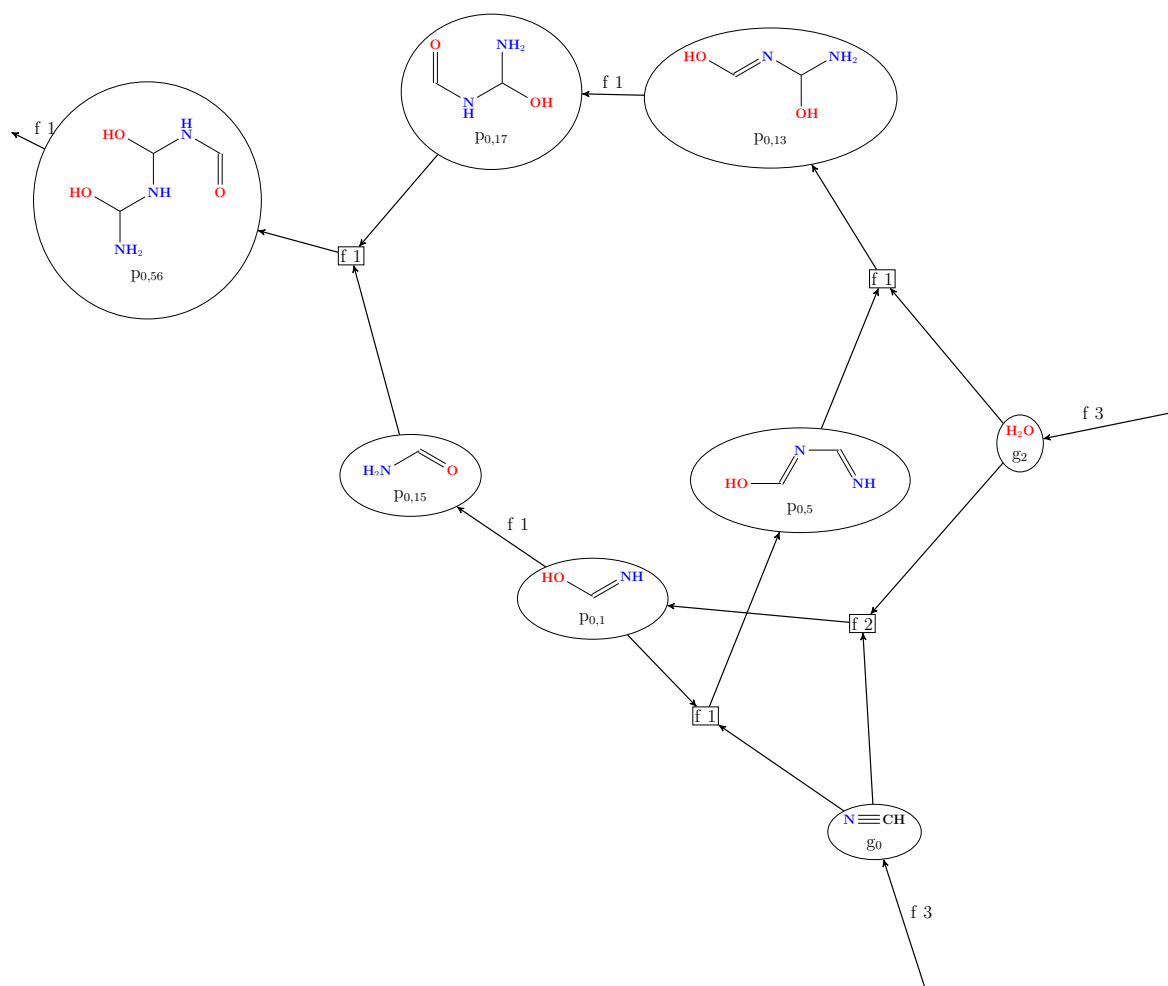
### 0.3.1 Solution 0

#### Overall Data

Objective value (non-integral): -0.122197

Vertex/Graph	In	Out	G	logK	t_order
g_{0}	3	0	-5.507152	1.000000	0
g_{2}	3	0	-5.068043	1.000000	0
p_{0,13}	0	0	-21.240678	-9.000000	3
p_{0,15}	0	0	-10.625174	-3.660259	2
p_{0,17}	0	0	-21.248844	-0.401440	11
p_{0,1}	0	0	-10.610101	1.000000	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/031\_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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	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
$p_{0,15}$	0	0	-27896.389963	-3.660259	-27908.563198	2
$p_{0,17}$	0	0	-55788.832737	-0.40144	-55790.167841	11
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2$	$p_{0,1}$	2	-94.140854	-94.140854
14	$g_0, p_{0,1}$	$p_{0,5}$	1	-137.037715	-137.037715
36	$p_{0,1}$	$p_{0,15}$	1	-51.197173	-51.197173
123	$g_2, p_{0,5}$	$p_{0,13}$	1	-38.297886	-38.297886
181	$p_{0,15}, p_{0,17}$	$p_{0,56}$	1	0.006113	0.006113
250	$p_{0,13}$	$p_{0,17}$	1	0.006113	0.006113
Sum					-320.82817701720353

$\Delta G = -41.48022522085051$   
 $\Delta E = -0.12219699907509642$   
 $|E| = 7$   
 $|U| = 6$

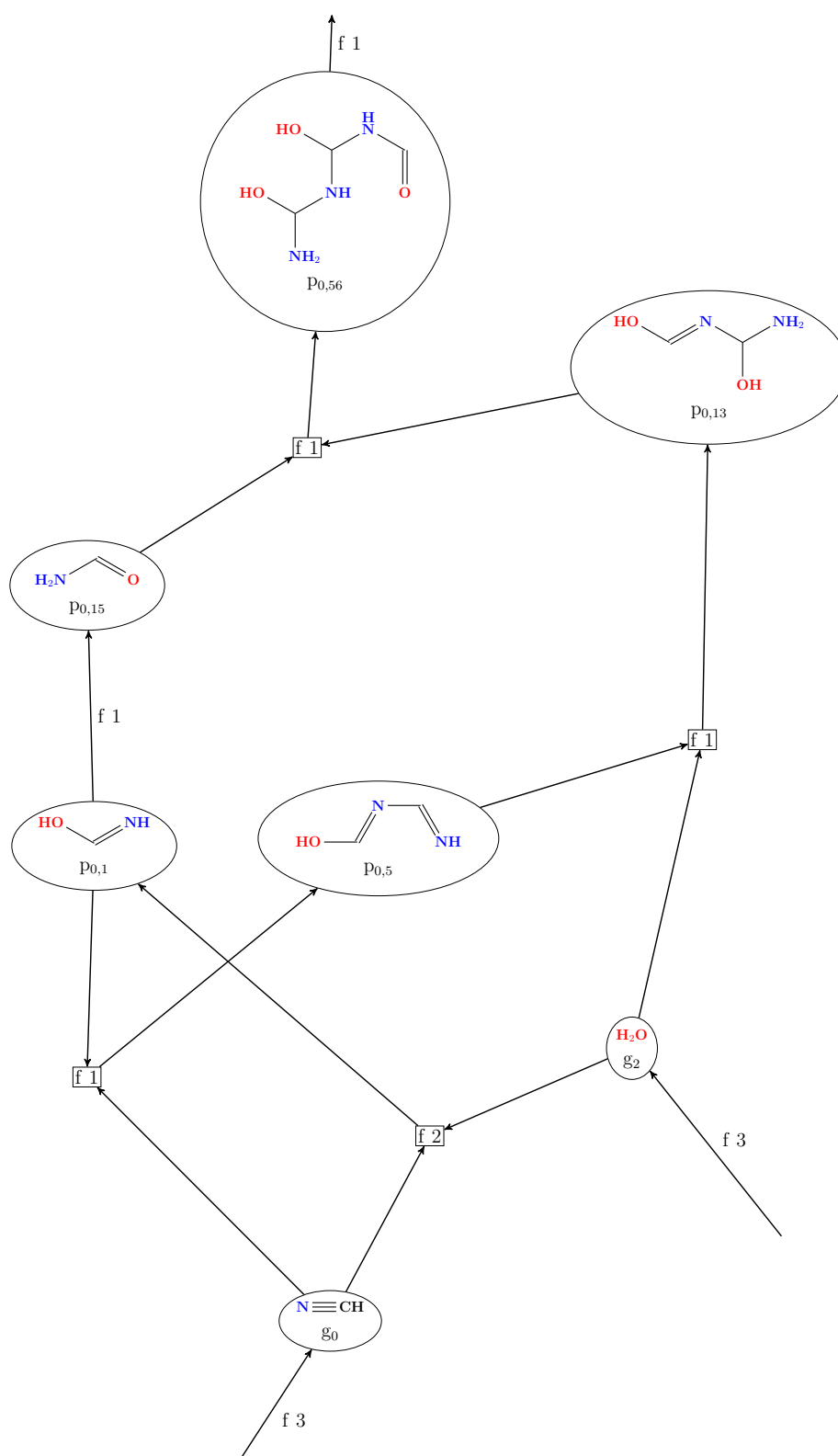
### 0.3.2 Solution 1

#### Overall Data

Objective value (non-integral): -0.122197

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-9.000000	0
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	64
$p_{\{0,15\}}$	0	0	-10.625174	-9.000000	2
$p_{\{0,1\}}$	0	0	-10.610101	-9.000000	1
$p_{\{0,56\}}$	0	1	-31.869260	-4.364567	67
$p_{\{0,5\}}$	0	0	-16.158998	-4.311659	2

# Filtered Graph



File: out/040\_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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.817054	-9.0	-27886.74912	1
$p_{0,5}$	0	0	-42425.44262	-4.311659	-42439.782271	2
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	64
$p_{0,15}$	0	0	-27896.389963	-9.0	-27926.322028	2
$p_{0,56}$	0	1	-83672.731446	-4.364567	-83687.247057	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-94.140854	-94.140854
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-100.400016	-100.400016
36	$p_{0,1},$	$p_{0,15},$	1	-39.572909	-39.572909
123	$g_2, p_{0,5},$	$p_{0,13},$	1	0.006113	0.006113
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-320.8281770172054

$$\Delta G = -32.8242401391455$$

$$\Delta E = -0.12219699907509714$$

$$|E| = 6$$

$$|U| = 5$$

### 0.3.3 Solution 2

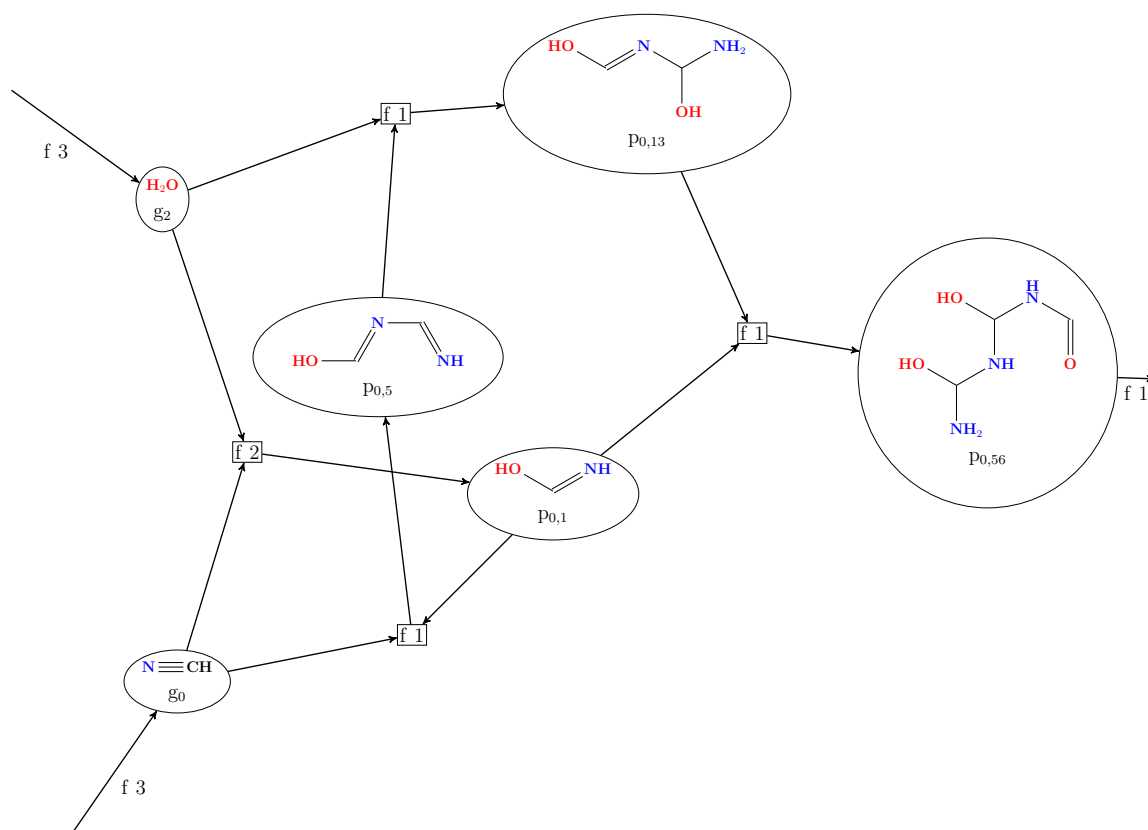
#### Overall Data

Objective value (non-integral): -0.122197

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	34
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	32
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67
$p_{\{0,5\}}$	0	0	-16.158998	-9.000000	33



## 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	-9.0	-14488.957643	0
$g_2$	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	32
$p_{0,5}$	0	0	-42425.44262	-9.0	-42455.374686	33
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	34
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-44.254079	-44.254079
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-112.094327	-112.094327
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-13.354498	-13.354498
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-51.184947	-51.184947
Sum				-320.8281770172073	

$$\Delta G = -26.514192282958568$$

$$\Delta E = -0.12219699907509785$$

$$|E| = 5$$

$$|U| = 4$$

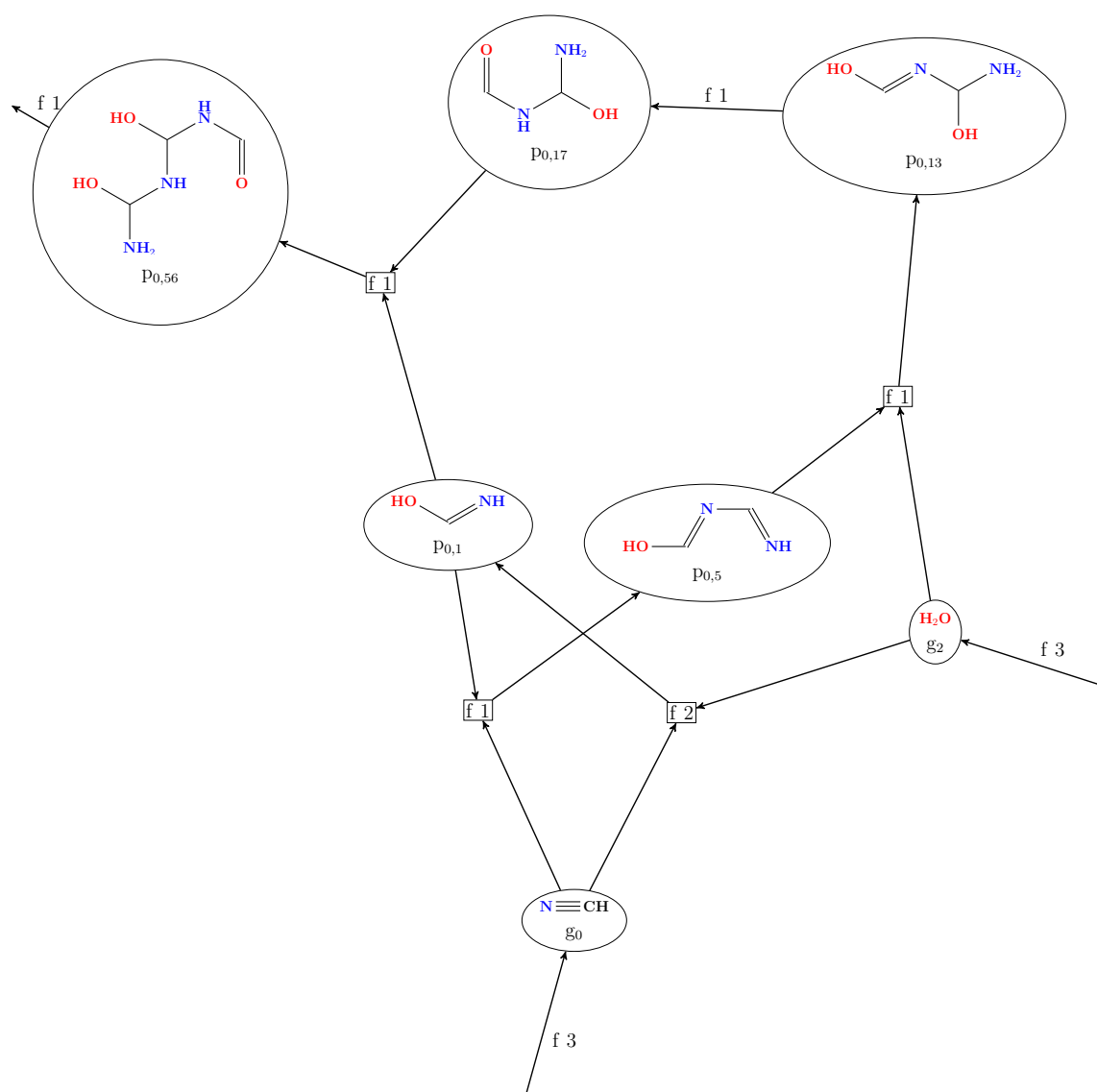
### 0.3.4 Solution 3

#### Overall Data

Objective value (non-integral): -0.122197

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-9.000000	0
$p_{\{0,13\}}$	0	0	-21.240678	-3.643626	64
$p_{\{0,17\}}$	0	0	-21.248887	-9.000000	65
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	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/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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	1
$p_{0,5}$	0	0	-42425.44262	-9.0	-42455.374686	2
$p_{0,13}$	0	0	-55767.391129	-3.643626	-55779.509046	64
$p_{0,17}$	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	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-69.197466	-69.197466
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-137.037715	-137.037715
123	$g_2, p_{0,5},$	$p_{0,13},$	1	0.006113	0.006113
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-29.631761	-29.631761
250	$p_{0,13},$	$p_{0,17},$	1	-34.913797	-34.913797
Sum					-320.8281770172054

$$\Delta G = -33.99720914572948$$

$$\Delta E = -0.12219699907509712$$

$$|E| = 6$$

$$|U| = 5$$

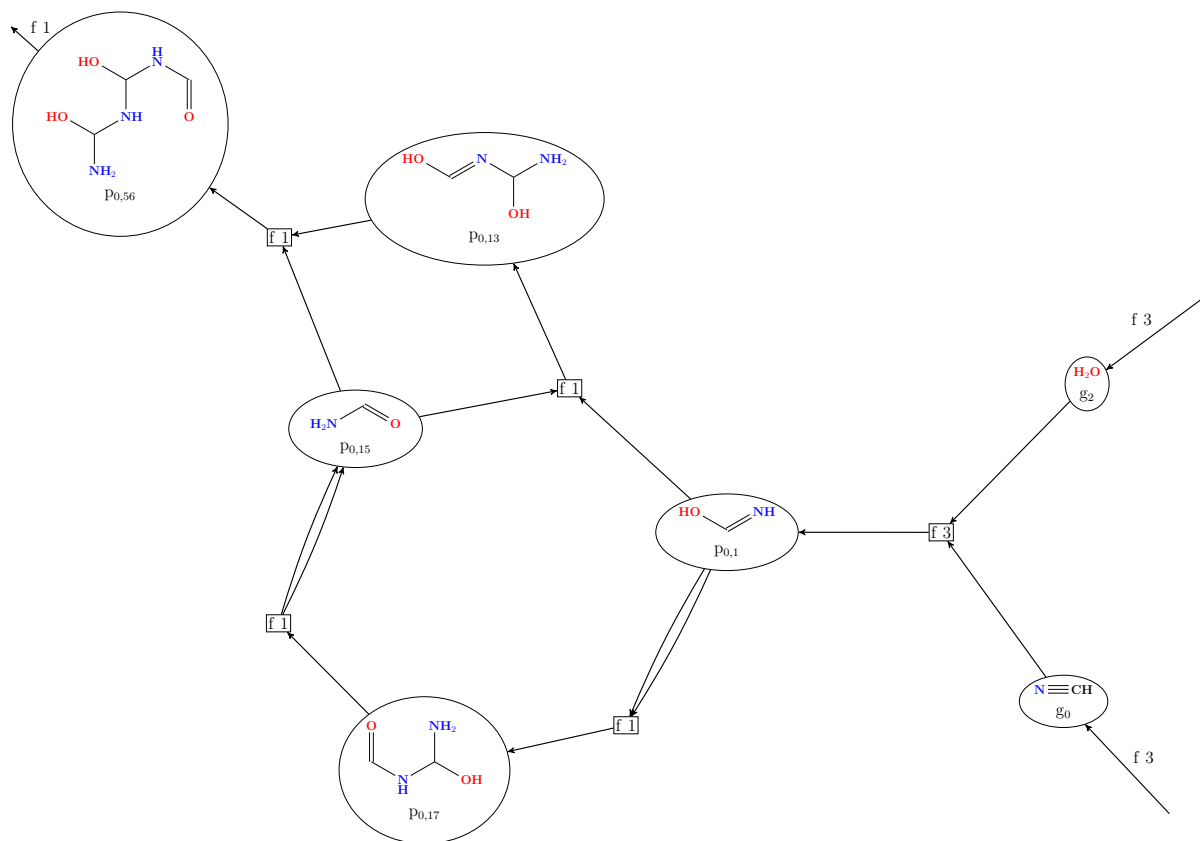
### 0.3.5 Solution 4

#### Overall Data

Objective value (non-integral): -0.0863407

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	1.000000	0
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	40
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	26
$p_{\{0,17\}}$	0	0	-21.248887	0.459823	25
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	12
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

## Filtered Graph



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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	12
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	40
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	26
$p_{0,17}$	0	0	-55788.944315	0.459823	-55787.415043	25
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-94.140854	-94.140854
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-79.15193	-79.15193
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	-36.666961	-36.666961
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-16.566916	-16.566916
237	$p_{0,17},$	$p_{0,15}, p_{0,15},$	1	0.006113	0.006113
Sum					-226.68750598454426

$$\Delta G = -41.48022469575057$$

$$\Delta E = -0.08634071114534277$$

$$|E| = 7$$

$$|U| = 5$$

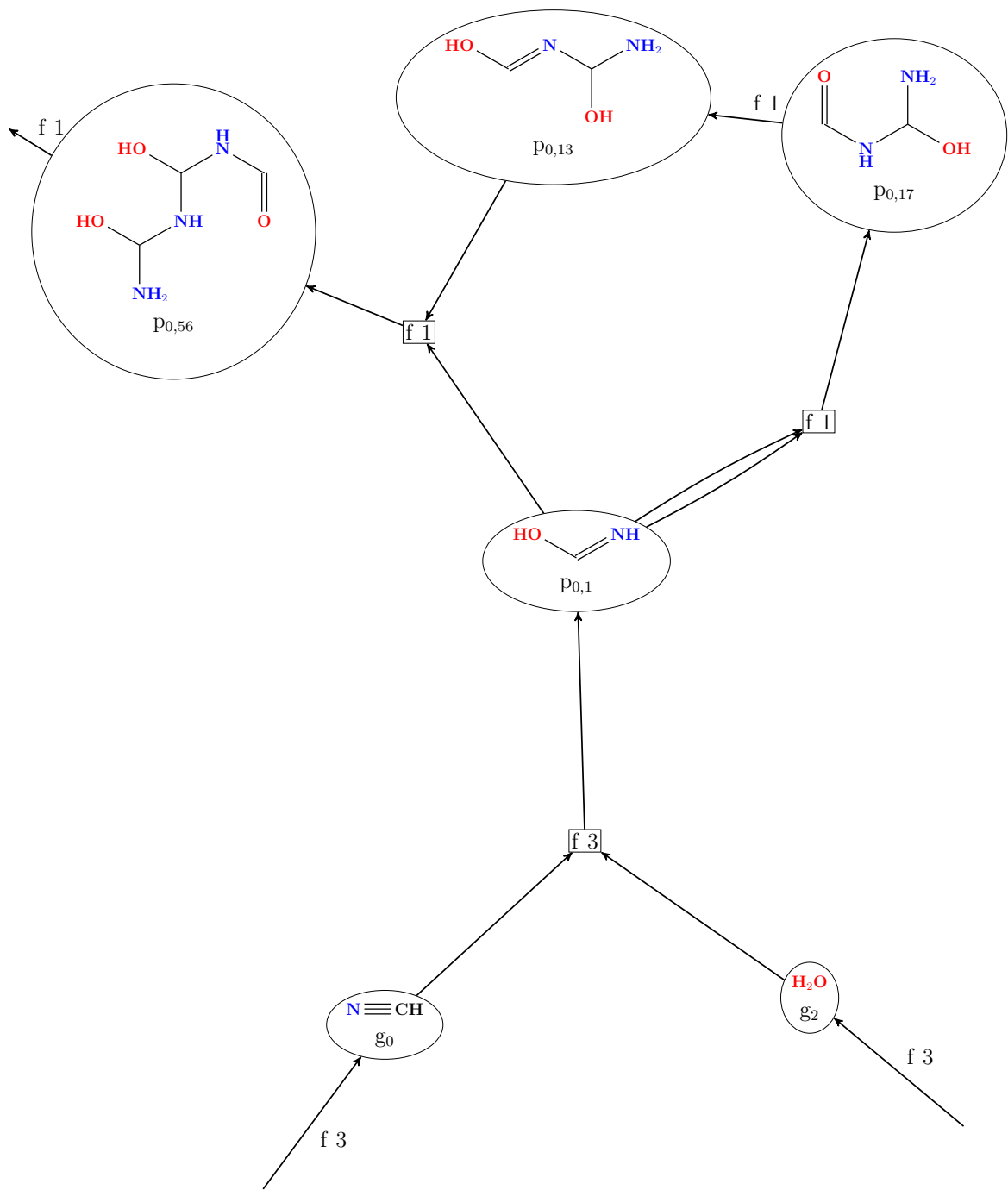
### 0.3.6 Solution 5

#### Overall Data

Objective value (non-integral): -0.0863407

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	1.000000	0
$p_{\{0,13\}}$	0	0	-21.240635	-7.640824	65
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	64
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	1
$p_{0,13}$	0	0	-55767.279594	-7.640824	-55792.691333	65
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	64
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-94.085141	-94.085141
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-77.804394	-77.804394
253	$p_{0,17},$	$p_{0,13},$	1	0.0	0.0
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-54.742441	-54.742441
Sum					-226.68750598454233

$$\Delta G = -41.48022495830054$$

$$\Delta E = -0.08634071114534203$$

$$|E| = 6$$

$$|U| = 4$$

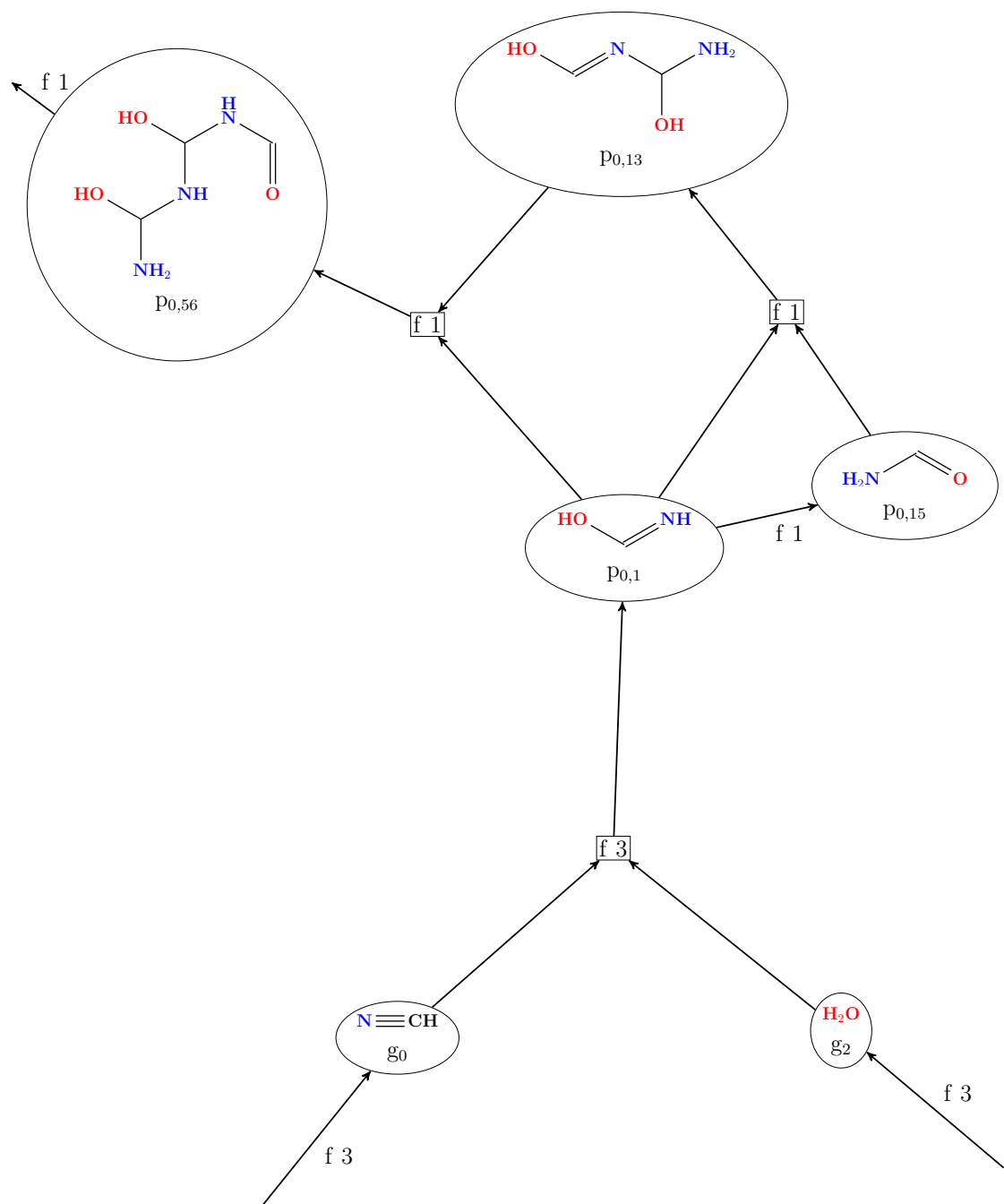
### 0.3.7 Solution 6

#### Overall Data

Objective value (non-integral): -0.0863407

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	1.000000	65
$p_{\{0,15\}}$	0	0	-10.625195	-5.644226	32
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	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	1.0	-27853.435556	1
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	65
$p_{0,15}$	0	0	-27896.445756	-5.644226	-27915.217237	32
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67



Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-44.198365	-44.198365
36	$p_{0,1},$	$p_{0,15},$	1	-56.257364	-56.257364
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	-76.295584	-76.295584
Sum					-226.68750598454233

$$\Delta G = -26.514192808058493$$

$$\Delta E = -0.08634071114534203$$

$$|E| = 6$$

$$|U| = 4$$

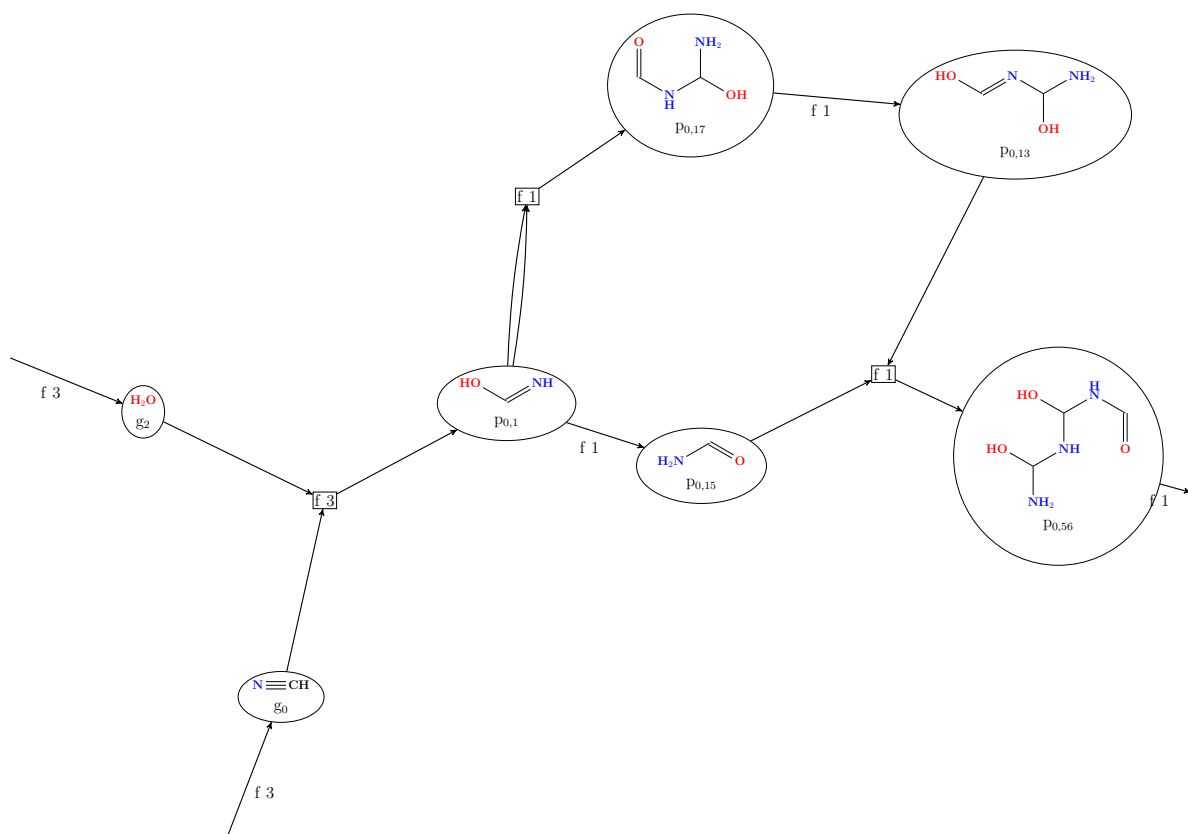
### 0.3.8 Solution 7

#### Overall Data

Objective value (non-integral): -0.0863407

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	1.000000	0
$p_{\{0,13\}}$	0	0	-21.240678	-9.000000	64
$p_{\{0,15\}}$	0	0	-10.625195	-3.635441	2
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	63
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	1
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	64
$p_{0,15}$	0	0	-27896.445756	-3.635441	-27908.536449	2
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	63
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2$	$p_{0,1}$	3	-94.085141	-94.085141
36	$p_{0,1}$	$p_{0,15}$	1	-51.246774	-51.246774
40	$p_{0,1}, p_{0,1}$	$p_{0,17}$	1	-77.804394	-77.804394
169	$p_{0,13}, p_{0,15}$	$p_{0,56}$	1	0.006113	0.006113
253	$p_{0,17}$	$p_{0,13}$	1	-3.50178	-3.50178
Sum					-226.68750598454045

$$\Delta G = -41.48022495830054$$

$$\Delta E = -0.08634071114534132$$

$$|E| = 7$$

$$|U| = 5$$

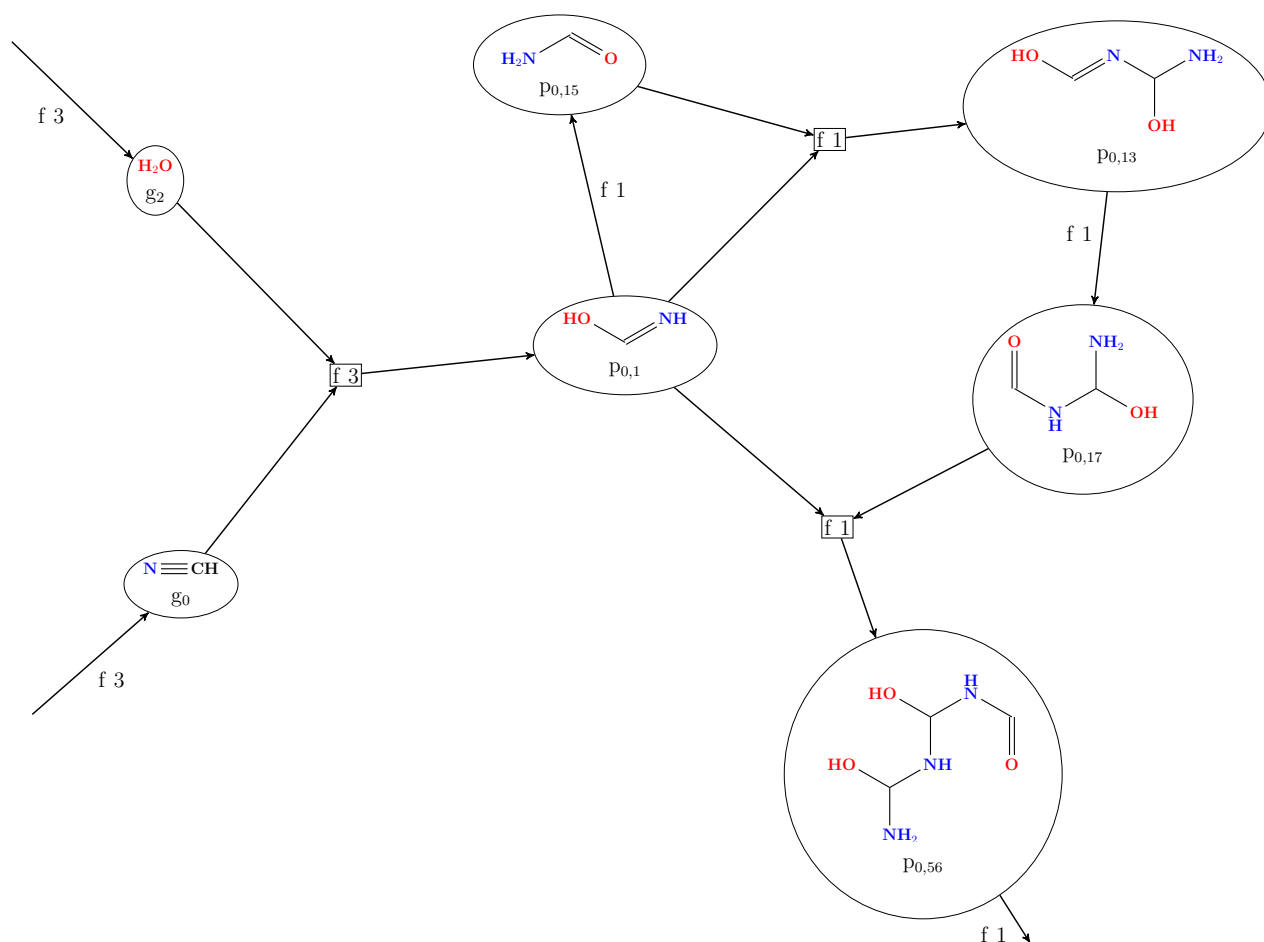
### 0.3.9 Solution 8

#### Overall Data

Objective value (non-integral): -0.0863407

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	1.000000	44
$p_{\{0,15\}}$	0	0	-10.625195	1.000000	22
$p_{\{0,17\}}$	0	0	-21.248887	1.000000	45
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	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	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	21
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	44
$p_{0,15}$	0	0	-27896.445756	1.0	-27893.119971	22
$p_{0,17}$	0	0	-55788.944315	1.0	-55785.61853	45
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-44.198365	-44.198365
36	$p_{0,1},$	$p_{0,15},$	1	-39.684415	-39.684415
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-16.566836	-16.566836
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-54.630863	-54.630863
250	$p_{0,13},$	$p_{0,17},$	1	-21.664721	-21.664721
Sum					-226.68750598454042

$$\Delta G = -26.514192282958568$$

$$\Delta E = -0.08634071114534131$$

$$|E| = 7$$

$$|U| = 5$$

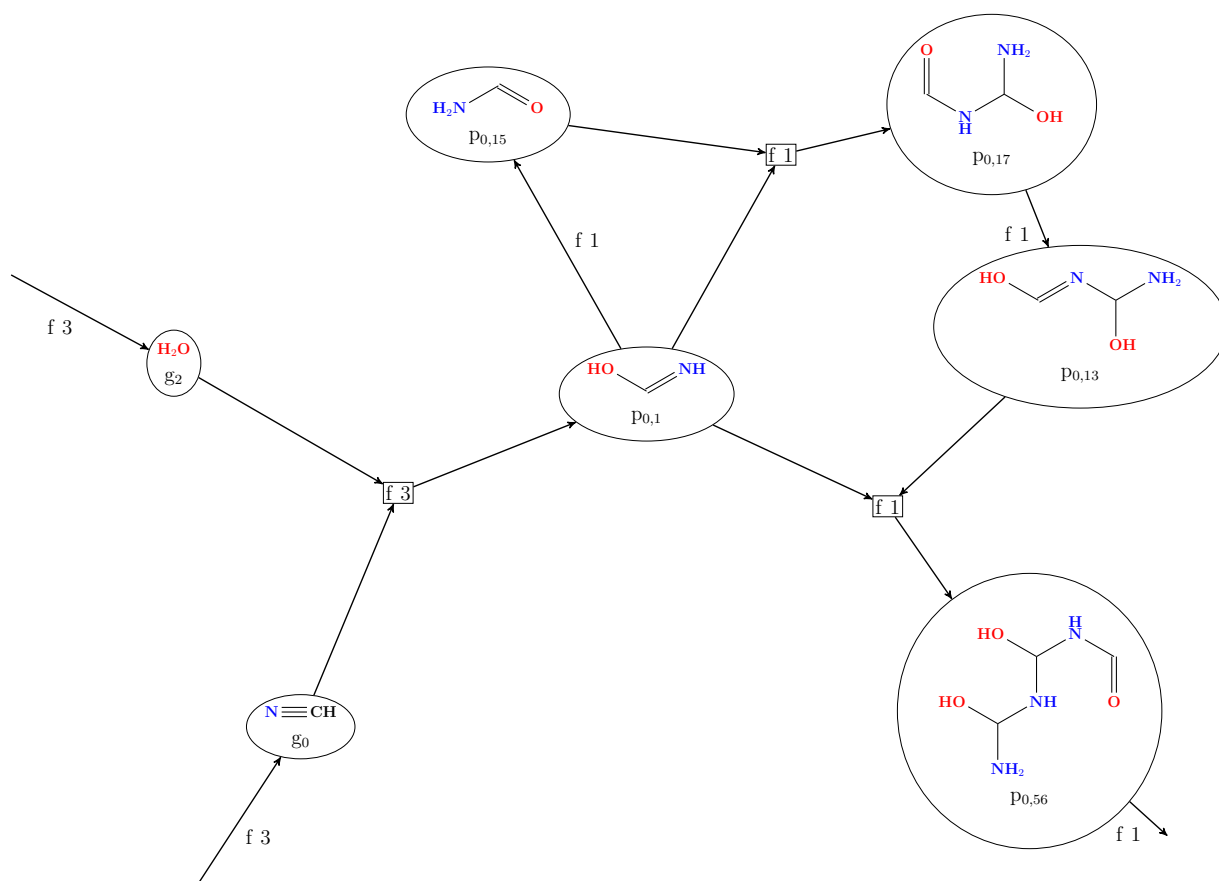
### 0.3.10 Solution 9

#### Overall Data

Objective value (non-integral): -0.0863407

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	-9.000000	0
$g_{\{2\}}$	3	0	-5.068043	1.000000	20
$p_{\{0,13\}}$	0	0	-21.240678	-9.000000	45
$p_{\{0,15\}}$	0	0	-10.625195	1.000000	22
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	44
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

## Filtered Graph



File: out/112\_dg\_0\_11100\_f\_0\_9\_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	1.0	-13302.819176	20
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	21
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	45
$p_{0,15}$	0	0	-27896.445756	1.0	-27893.119971	22
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	44
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2$	$p_{0,1}$	3	-69.141753	-69.141753
36	$p_{0,1}$	$p_{0,15}$	1	-39.684415	-39.684415
183	$p_{0,1}, p_{0,15}$	$p_{0,17}$	1	-38.119979	-38.119979
253	$p_{0,17}$	$p_{0,13}$	1	-3.50178	-3.50178
263	$p_{0,1}, p_{0,13}$	$p_{0,56}$	1	-51.240661	-51.240661
Sum					-226.68750598454042

$$\Delta G = -33.99720835807959$$

$$\Delta E = -0.08634071114534131$$

$$|E| = 7$$

$$|U| = 5$$

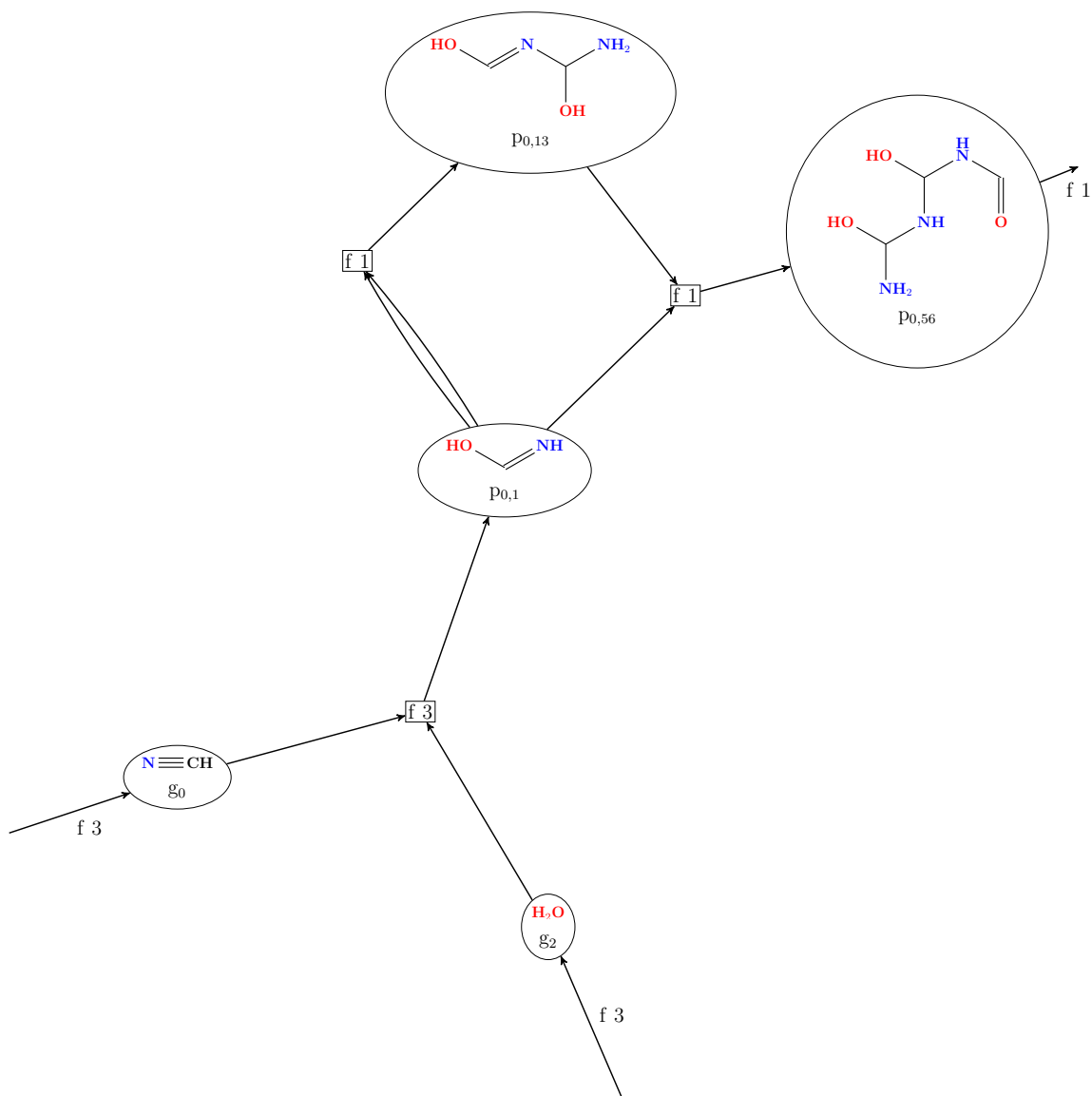
### 0.3.11 Solution 10

#### Overall Data

Objective value (non-integral): -0.0863407

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	20
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	43
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	21
$p_{\{0,56\}}$	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	20
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	21
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	43
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-44.198365	-44.198365
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-56.251251	-56.251251
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-76.295584	-76.295584
Sum					-226.68750598454042

$$\Delta G = -26.514192808058493$$

$$\Delta E = -0.08634071114534131$$

$$|E| = 5$$

$$|U| = 3$$

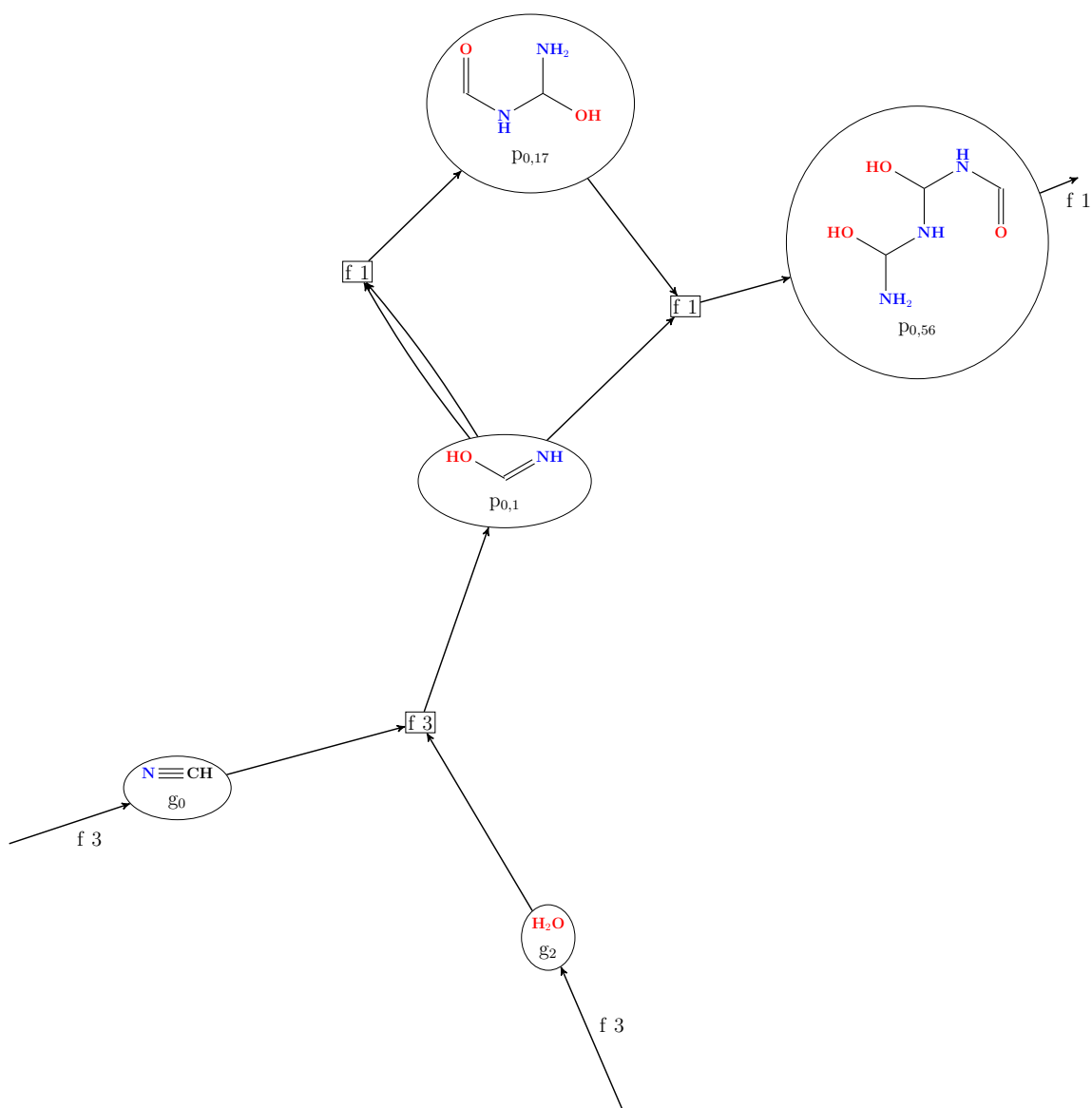
### 0.3.12 Solution 11

#### Overall Data

Objective value (non-integral): -0.0863407

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	1.000000	0
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	43
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

## Filtered Graph



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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	21
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	43
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-94.085141	-94.085141
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-77.804394	-77.804394
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-54.742441	-54.742441
Sum					-226.68750598454042

$$\Delta G = -41.48022495830054$$

$$\Delta E = -0.08634071114534131$$



$$|E| = 5$$

$$|U| = 3$$

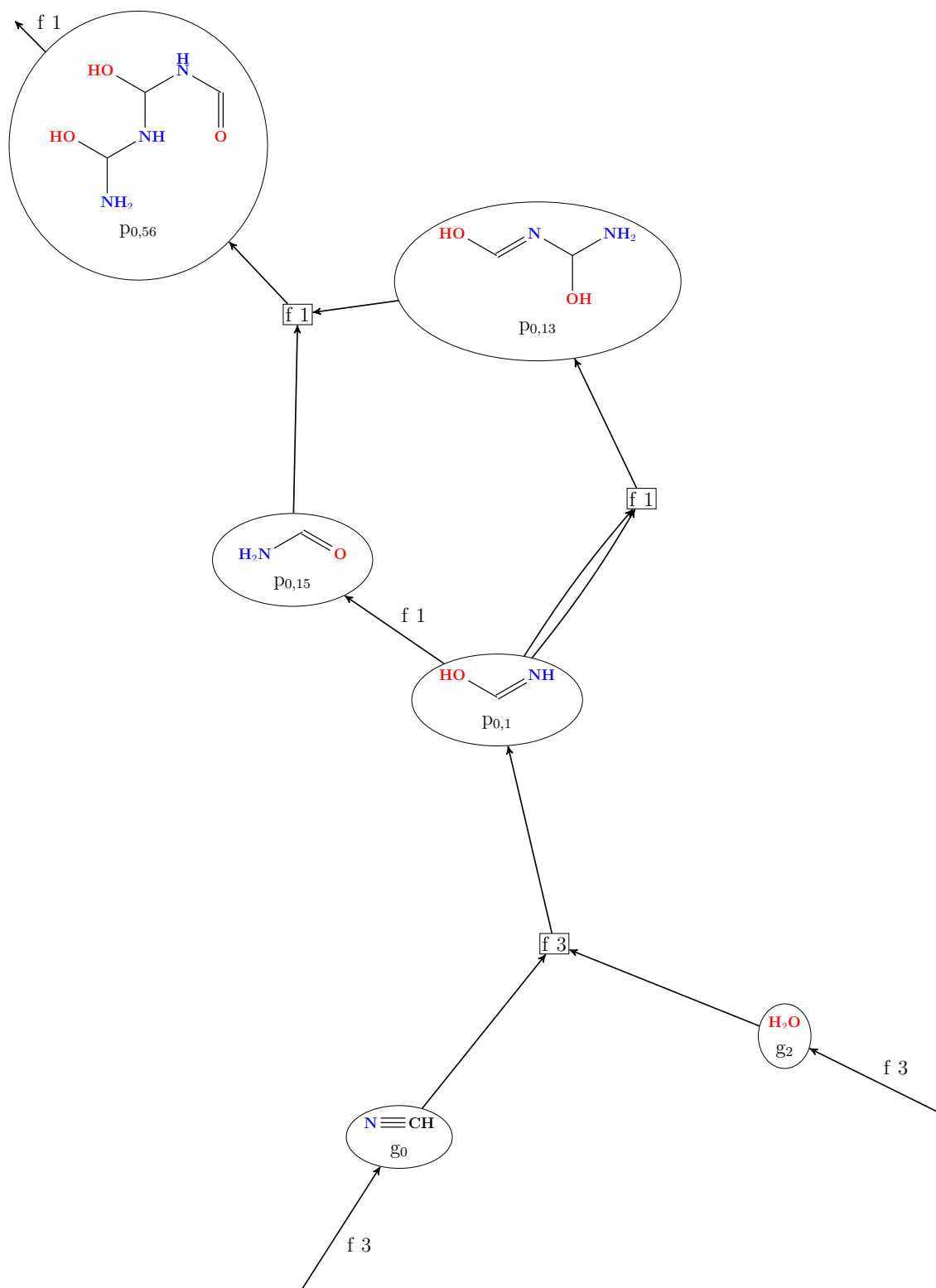
### 0.3.13 Solution 12

#### Overall Data

Objective value (non-integral): -0.0863407

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-9.000000	0
$p_{\{0,13\}}$	0	0	-21.240678	-3.635441	44
$p_{\{0,15\}}$	0	0	-10.625195	-9.000000	22
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	21
$p_{\{0,56\}}$	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	21
$p_{0,13}$	0	0	-55767.391129	-3.635441	-55779.481823	44
$p_{0,15}$	0	0	-27896.445756	-9.0	-27926.377821	22
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-69.197466	-69.197466
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-67.813718	-67.813718
36	$p_{0,1},$	$p_{0,15},$	1	-64.572089	-64.572089
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-226.68750598453857

$$\Delta G = -33.99720914572948$$

$$\Delta E = -0.0863407111453406$$

$$|E| = 6$$

$$|U| = 4$$

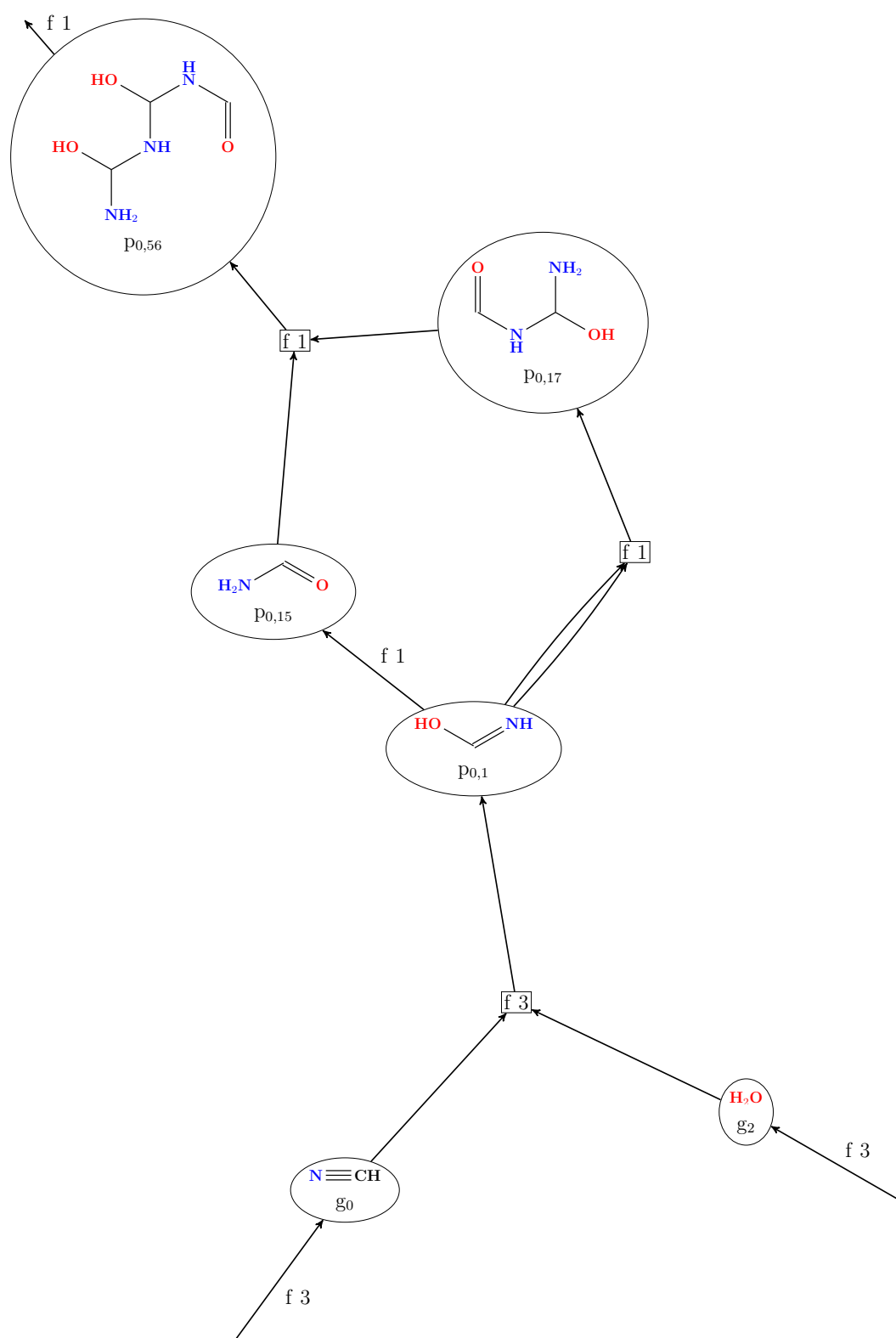
### 0.3.14 Solution 13

#### Overall Data

Objective value (non-integral): -0.0863407

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	1.000000	50
$p_{\{0,17\}}$	0	0	-21.248887	-4.994599	16
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

## Filtered Graph



File: out/148\_dg\_0\_11100\_f\_0\_13\_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	1.0	-27853.491269	1
$p_{0,15}$	0	0	-27896.445756	1.0	-27893.119971	50
$p_{0,17}$	0	0	-55788.944315	-4.994599	-55805.555278	16
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-44.254079	-44.254079
36	$p_{0,1},$	$p_{0,15},$	1	-39.628701	-39.628701
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-92.757106	-92.757106
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-226.68750598453857

$$\Delta G = -26.51419254550853$$

$$\Delta E = -0.0863407111453406$$

$$|E| = 6$$

$$|U| = 4$$

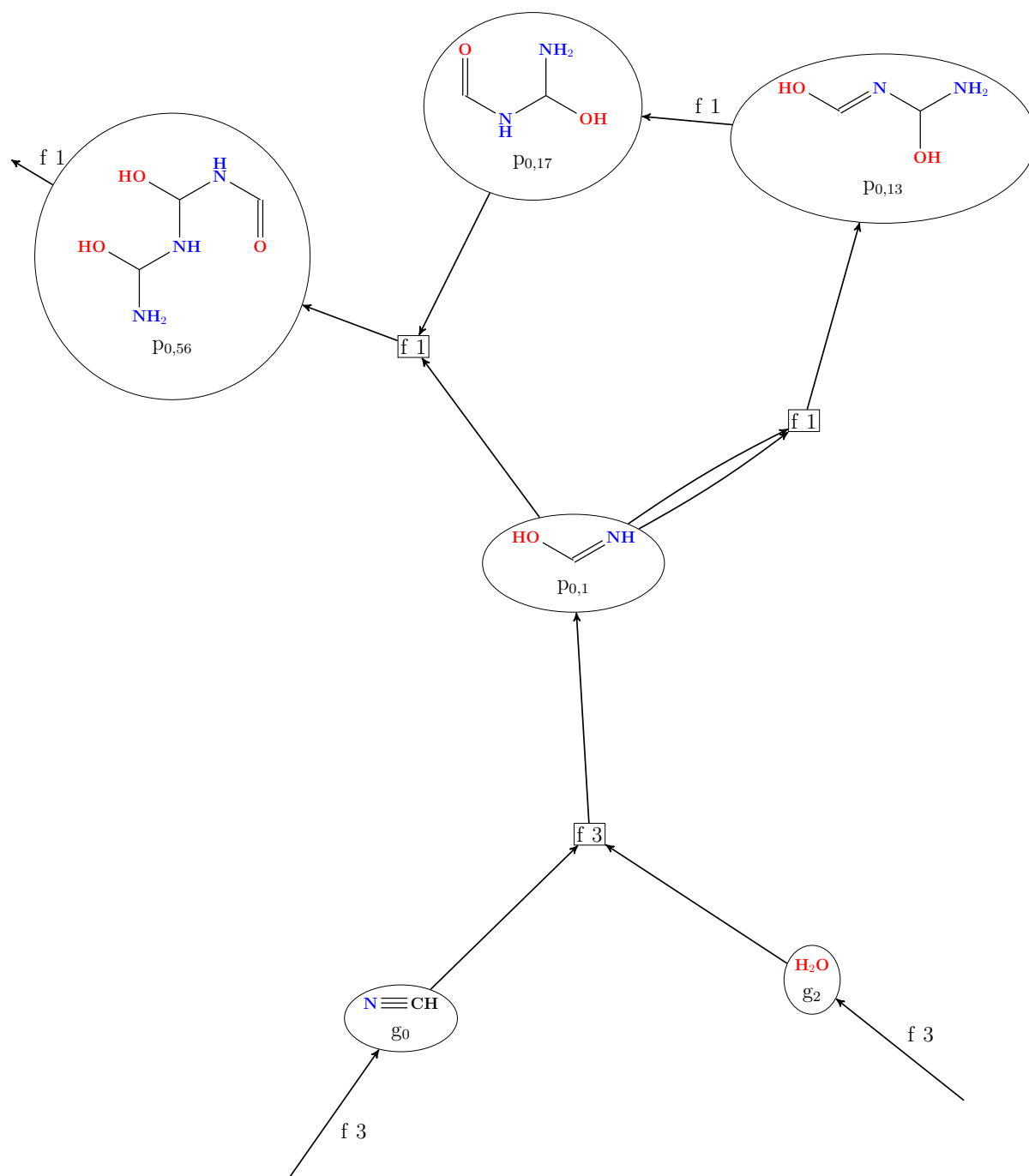
### 0.3.15 Solution 14

#### Overall Data

Objective value (non-integral): -0.0863407

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	1.000000	3
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	65
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

## Filtered Graph



File: out/157\_dg\_0\_11100\_f\_0\_14\_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	1.0	-27853.435556	1
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	3
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	65
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-44.198365	-44.198365
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-56.251251	-56.251251
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-54.742441	-54.742441
250	$p_{0,13},$	$p_{0,17},$	1	-21.553143	-21.553143
Sum					-226.68750598453855

$$\Delta G = -26.51419254550853$$

$$\Delta E = -0.08634071114534059$$

$$|E| = 6$$

$$|U| = 4$$

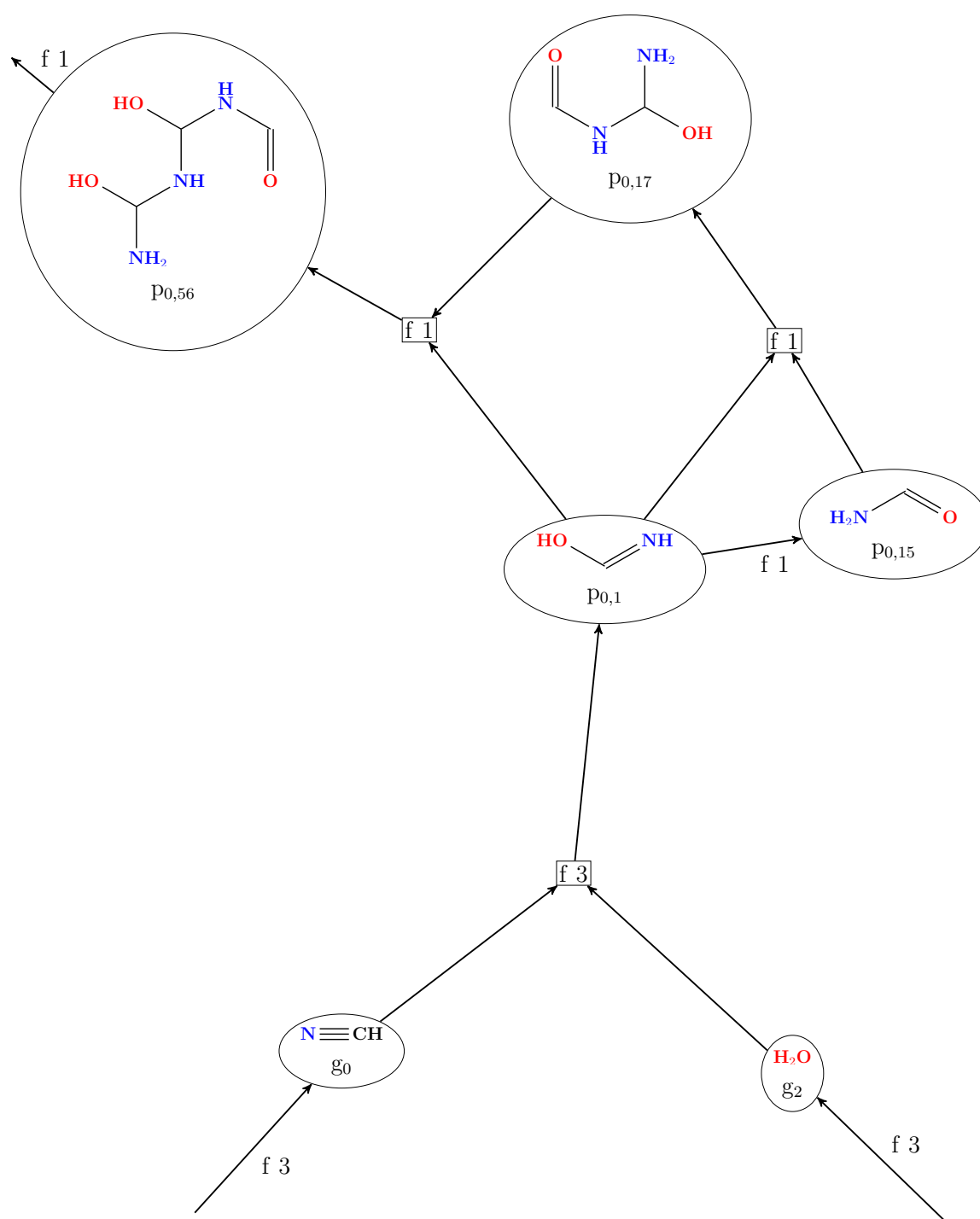
### 0.3.16 Solution 15

#### Overall Data

Objective value (non-integral): -0.0863407

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	-9.000000	2
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	4
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

## Filtered Graph



File: out/166\_dg\_0\_11100\_f\_0\_15\_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	1.0	-27853.435556	1
$p_{0,15}$	0	0	-27896.445756	-9.0	-27926.377821	2
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	4
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-44.198365	-44.198365
36	$p_{0,1},$	$p_{0,15},$	1	-64.627803	-64.627803
183	$p_{0,1}, p_{0,15},$	$p_{0,17},$	1	-13.176591	-13.176591
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-54.742441	-54.742441
Sum					-226.68750598453855

$$\Delta G = -26.51419254550853$$

$$\Delta E = -0.08634071114534059$$

$$|E| = 6$$

$$|U| = 4$$

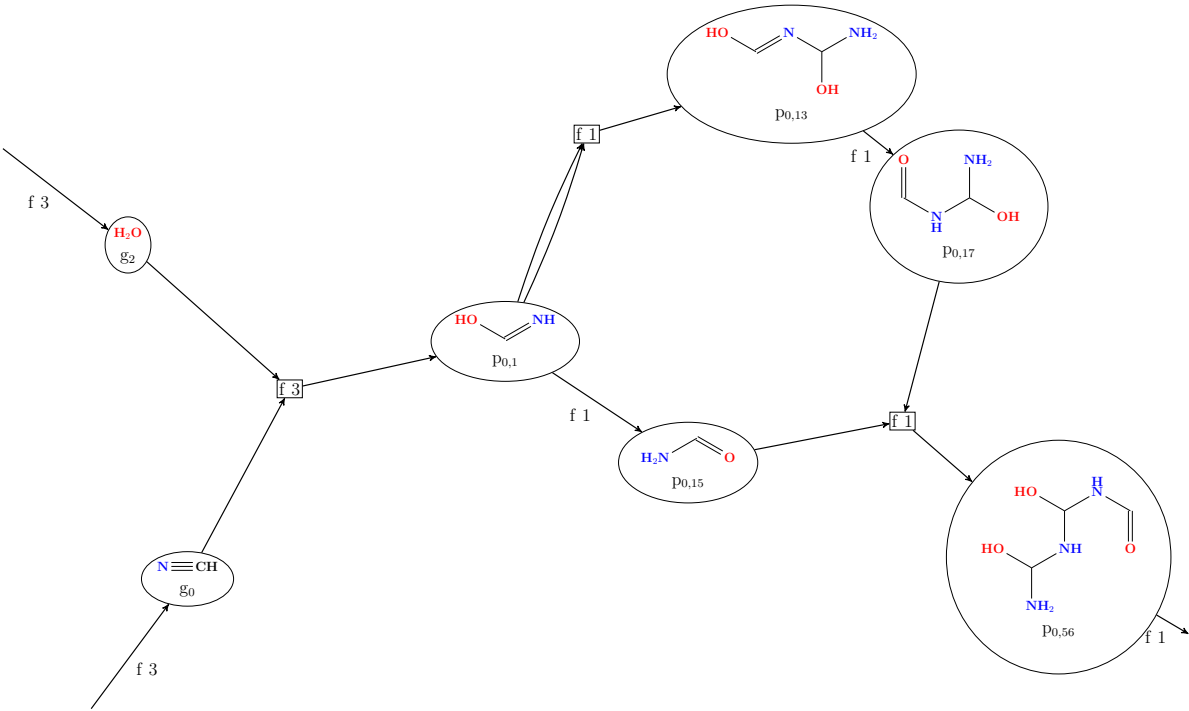
### 0.3.17 Solution 16

#### Overall Data

Objective value (non-integral): -0.0863407

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-9.000000	0
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	3
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	2
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	64
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

Filtered Graph



File: out/175\_dg\_0\_11100\_f\_0\_16\_filt

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	$x_v^K$	$x_v^{\Delta G}$	$t_v$
$g_0$	3	0	-14459.025578	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-9.0	-13336.077027	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	1
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	3
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	2
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	64
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-69.197466	-69.197466
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-56.139824	-56.139824
36	$p_{0,1},$	$p_{0,15},$	1	-39.572909	-39.572909
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	-15.113819	-15.113819
250	$p_{0,13},$	$p_{0,17},$	1	-21.553143	-21.553143
Sum				-226.68750598453667	

$\Delta G = -33.99720862062955$   
 $\Delta E = -0.08634071114533988$   
 $|E| = 7$   
 $|U| = 5$

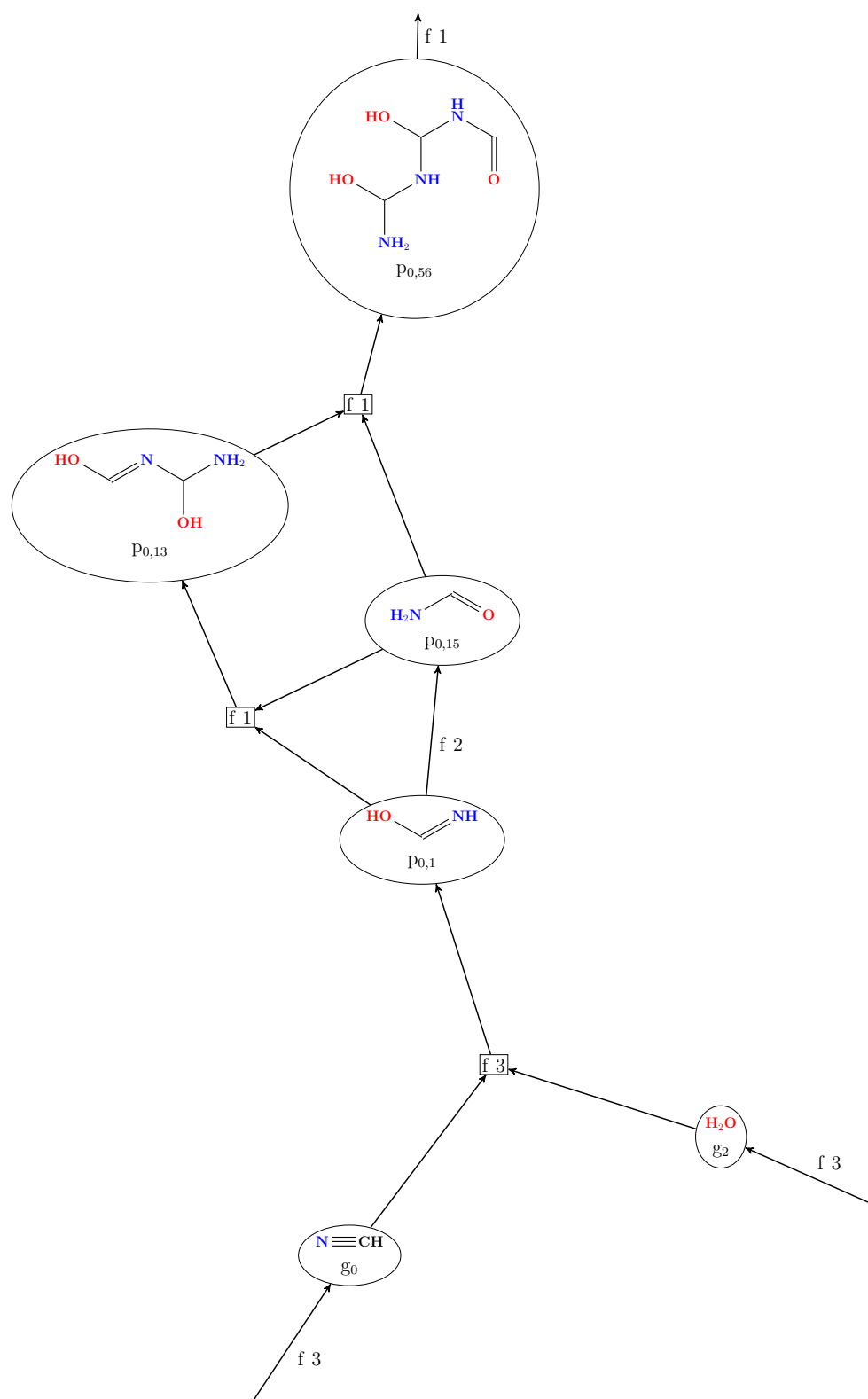
0.3.18 Solution 17

Overall Data

Objective value (non-integral): -0.071247

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	1.000000	0
$p_{\{0,13\}}$	0	0	-21.240678	-9.000000	64
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	2
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

# Filtered Graph



File: out/184\_dg\_0\_11100\_f\_0\_17\_filt

Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	$x_v^K$	$x_v^{\Delta G}$	$t_v$
$g_0$	3	0	-14459.025578	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	1
$p_{0,13}$	0	0	-55767.391129	-9.0	-55797.323194	64
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	2
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-94.085141	-94.085141
36	$p_{0,1},$	$p_{0,15},$	2	-39.628622	-39.628622
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	-11.612039	-11.612039
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-41.677552	-41.677552
Sum					-187.05888388074723

$$\Delta G = -41.48022522085051$$

$$\Delta E = -0.07124696612710092$$

$$|E| = 7$$

$$|U| = 4$$

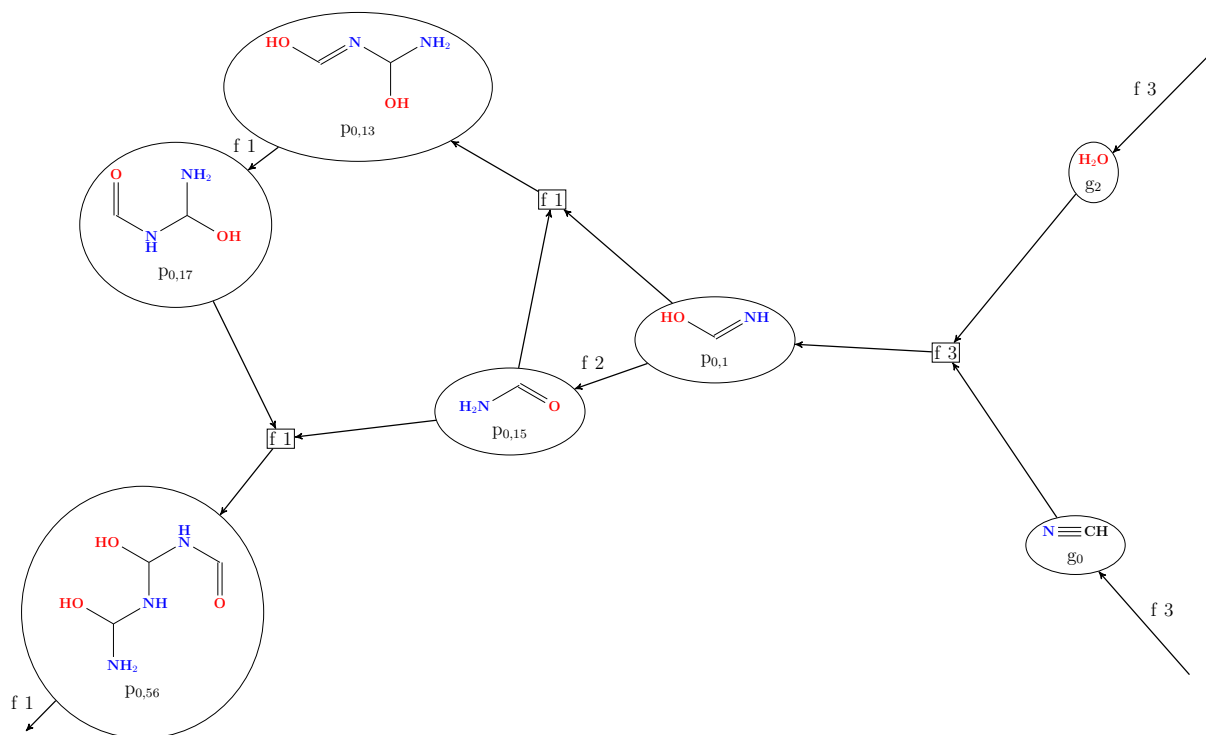
### 0.3.19 Solution 18

#### Overall Data

Objective value (non-integral): -0.071247

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	19
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	44
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	21
$p_{\{0,17\}}$	0	0	-21.248887	-5.014516	45
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	20
$p_{\{0,56\}}$	0	1	-31.869324	-9.000000	67

## Filtered Graph



File: out/193\_dg\_0\_11100\_f\_0\_18\_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	19
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	20
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	44
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	21
$p_{0,17}$	0	0	-55788.944315	-5.014516	-55805.621518	45
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-44.254079	-44.254079
36	$p_{0,1},$	$p_{0,15},$	2	-39.572909	-39.572909
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	0.0	0.0
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-16.566916	-16.566916
250	$p_{0,13},$	$p_{0,17},$	1	-36.666961	-36.666961
Sum				-187.05888388074536	

$$\Delta G = -26.5141920204086$$

$$\Delta E = -0.0712469661271002$$

$$|E| = 8$$

$$|U| = 5$$

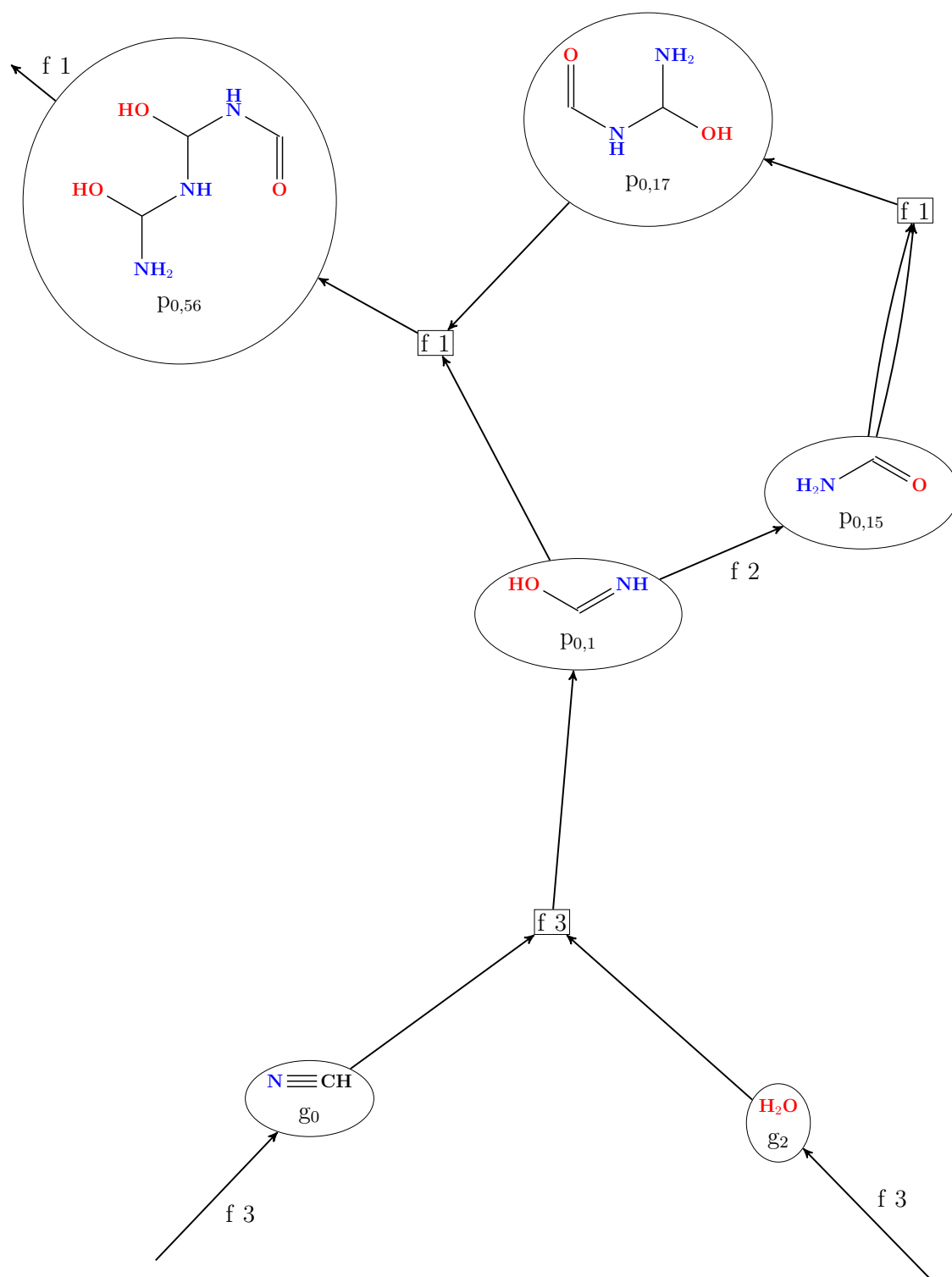
### 0.3.20 Solution 19

#### Overall Data

Objective value (non-integral): -0.071247

Vertex/Graph	In	Out	G	logK	t_order
g_{0}	3	0	-5.507152	1.000000	0
g_{2}	3	0	-5.068043	1.000000	0
p_{0,15}	0	0	-10.625174	1.000000	2
p_{0,17}	0	0	-21.248844	0.417541	5
p_{0,1}	0	0	-10.610080	1.000000	1
p_{0,56}	0	1	-31.869324	-9.000000	67

## Filtered Graph



File: out/202\_dg\_0\_11100\_f\_0\_19\_filt



Vertex	InFlow	OutFlow	$x_v^{\Delta G^0}$	$x_v^K$	$x_v^{\Delta G}$	$t_v$
$g_0$	3	0	-14459.025578	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	1
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	2
$p_{0,17}$	0	0	-55788.832737	0.417541	-55787.444085	5
$p_{0,56}$	0	1	-83672.898792	-9.0	-83702.830857	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-94.085141	-94.085141
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	-53.289591	-53.289591
Sum					-187.05888388074533

$$\Delta G = -41.48022522085051$$

$$\Delta E = -0.07124696612710019$$

$$|E| = 7$$

$$|U| = 4$$