

# Summary

December 6, 2024

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## 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

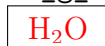


File: out/007\_g\_1\_11310100

### 0.1.3 g\_{2}



File: out/009\_g\_2\_10300000



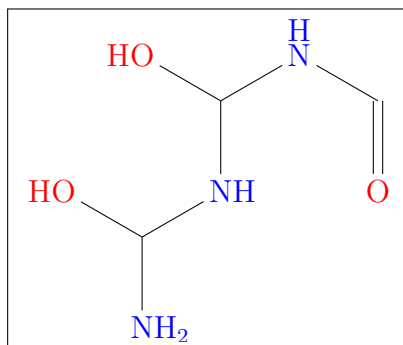
File: out/011\_g\_2\_11310100

## 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

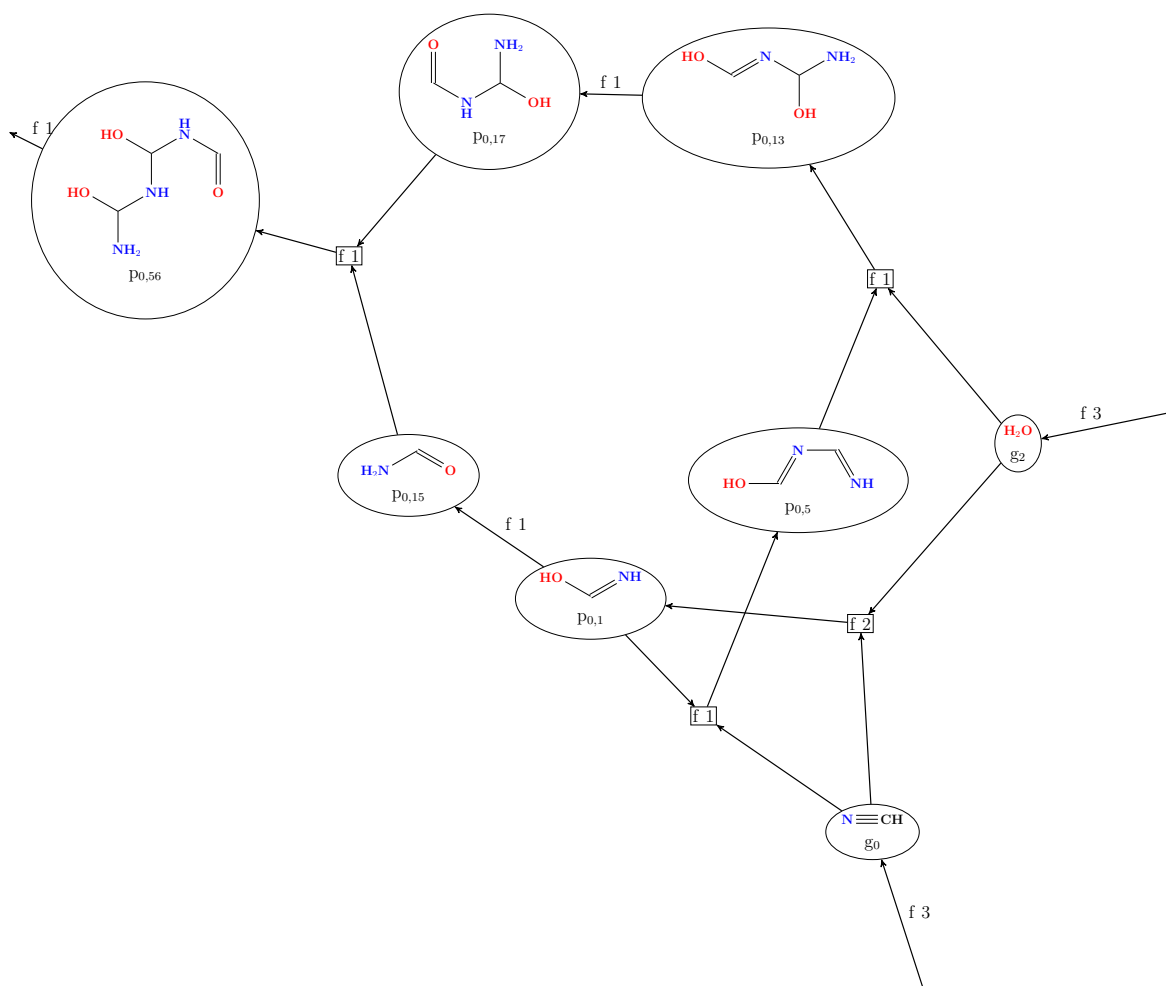
### 0.3.1 Solution 0

#### Overall Data

Objective value (non-integral): -0.118581

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	1.000000	10
p_{0,15}	0	0	-10.625174	1.000000	55
p_{0,17}	0	0	-21.248887	-1.622626	11
p_{0,1}	0	0	-10.610080	1.000000	1
p_{0,56}	0	1	-31.869324	-6.000000	67
p_{0,5}	0	0	-16.158998	-6.000000	9

## 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	-27856.761341	1.0	-27853.435556	1
$p_{0,5}$	0	0	-42425.44262	-6.0	-42445.397331	9
$p_{0,13}$	0	0	-55767.391129	1.0	-55764.065344	10
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	55
$p_{0,17}$	0	0	-55788.944315	-1.622626	-55794.340821	11
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-93.902223	-93.902223
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-128.147067	-128.147067
36	$p_{0,1},$	$p_{0,15},$	1	-39.628622	-39.628622
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-21.935024	-21.935024
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	0.006113	0.006113
250	$p_{0,13},$	$p_{0,17},$	1	-27.615178	-27.615178
Sum					-311.3330607073006

$\Delta G = -40.5124214202443$   
 $\Delta E = -0.11858050026964104$   
 $|E| = 7$   
 $|U| = 6$

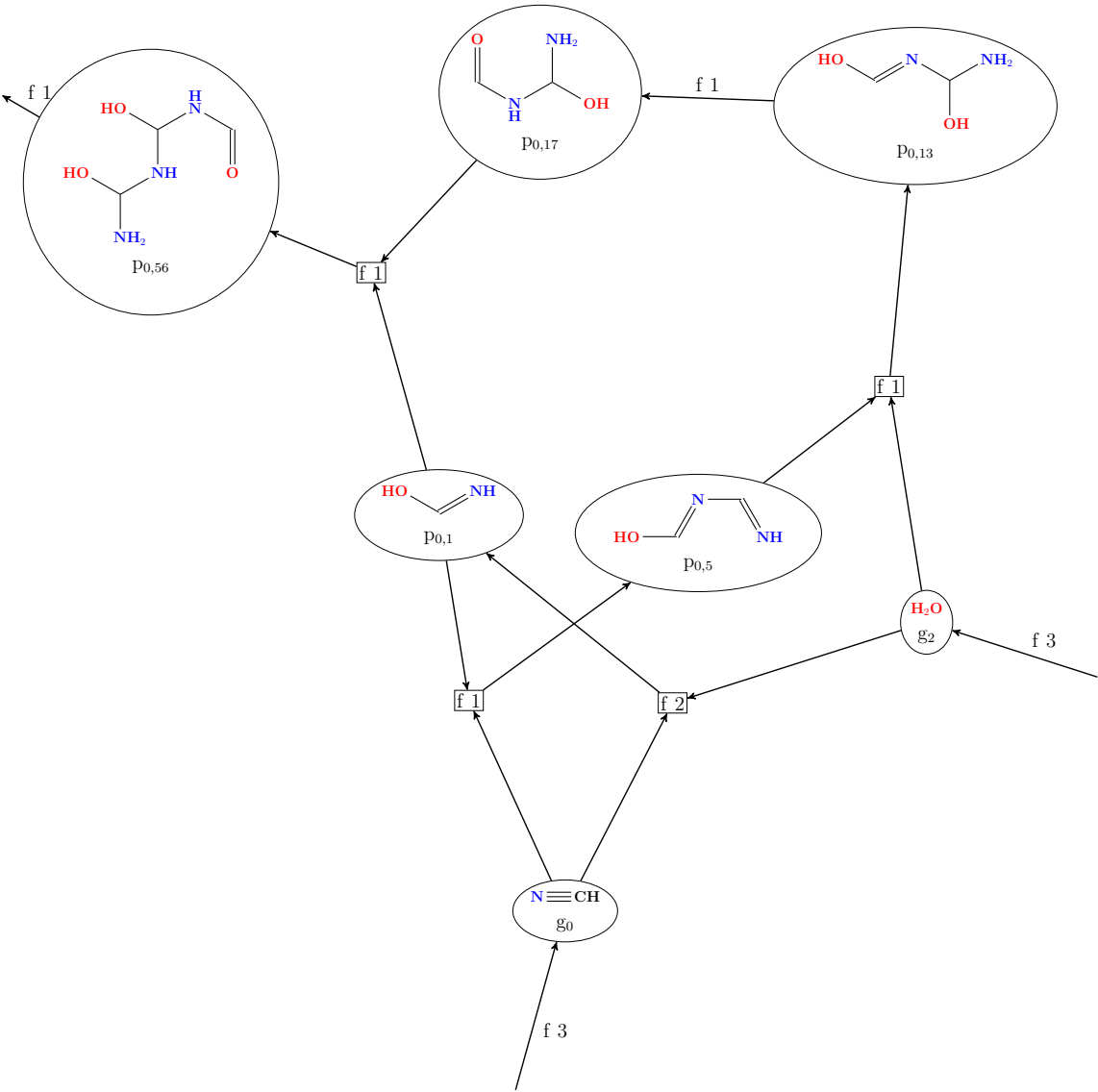
### 0.3.2 Solution 1

#### Overall Data

Objective value (non-integral): -0.118581

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	1.000000	64
$p_{\{0,17\}}$	0	0	-21.248887	-6.000000	65
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	67
$p_{\{0,5\}}$	0	0	-16.158998	1.000000	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	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	1
$p_{0,5}$	0	0	-42425.44262	1.0	-42422.116835	2
$p_{0,13}$	0	0	-55767.391129	1.0	-55764.065344	64
$p_{0,17}$	0	0	-55788.944315	-6.0	-55808.899025	65
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-93.957936	-93.957936
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-111.911409	-111.911409
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-38.114968	-38.114968
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-29.448843	-29.448843
250	$p_{0,13},$	$p_{0,17},$	1	-37.73313	-37.73313
Sum	-311.33306070730197				

$$\Delta G = -40.5124214202443$$

$$\Delta E = -0.11858050026964156$$

$$|E| = 6$$

$$|U| = 5$$

### 0.3.3 Solution 2

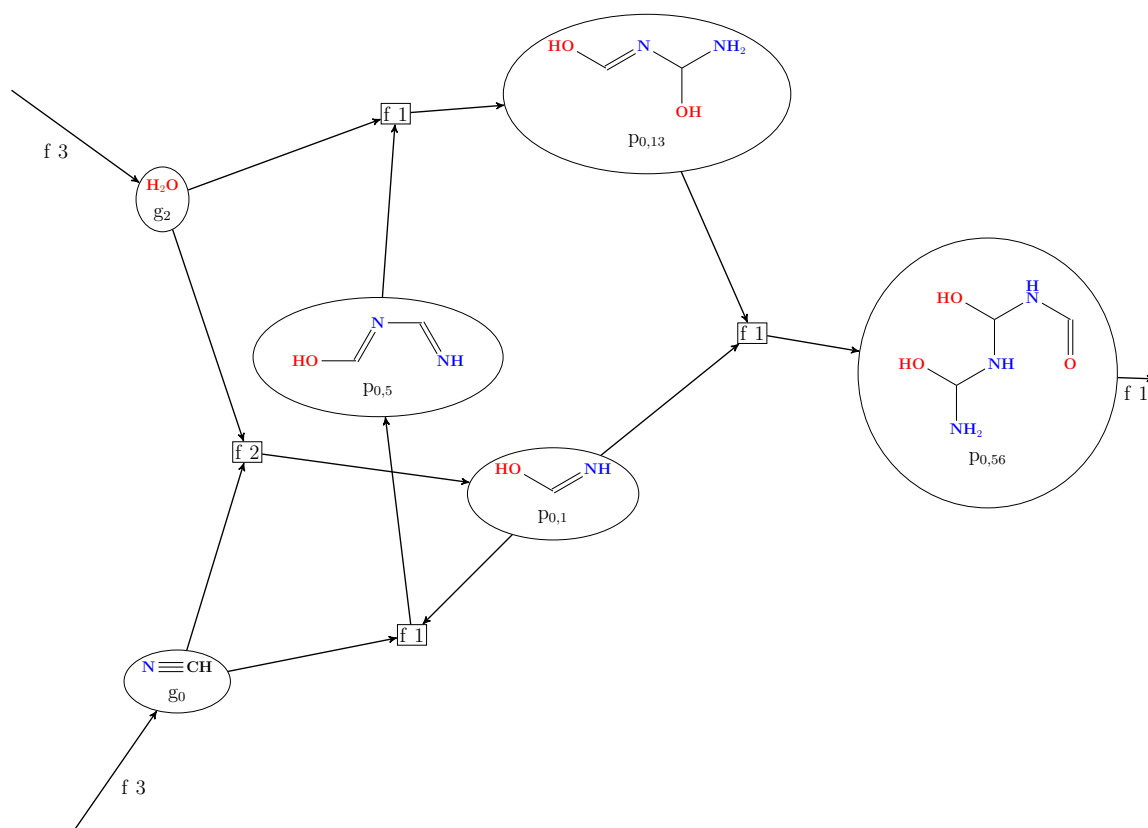
#### Overall Data

Objective value (non-integral): -0.118581

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	0
$p_{\{0,13\}}$	0	0	-21.240678	-6.000000	24
$p_{\{0,1\}}$	0	0	-10.610101	-6.000000	22
$p_{\{0,56\}}$	0	1	-31.869260	1.000000	67
$p_{\{0,5\}}$	0	0	-16.158998	1.000000	23



## 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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-6.0	-13326.099672	0
$p_{0,1}$	0	0	-27856.817054	-6.0	-27876.771765	22
$p_{0,5}$	0	0	-42425.44262	1.0	-42422.116835	23
$p_{0,13}$	0	0	-55767.391129	-6.0	-55787.345839	24
$p_{0,56}$	0	1	-83672.731446	1.0	-83669.405661	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-93.957936	-93.957936
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-95.731465	-95.731465
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-38.114968	-38.114968
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-18.474795	-18.474795
Sum				-311.33306070729867	

$$\Delta G = -34.02370910124065$$

$$\Delta E = -0.11858050026964032$$

$$|E| = 5$$

$$|U| = 4$$

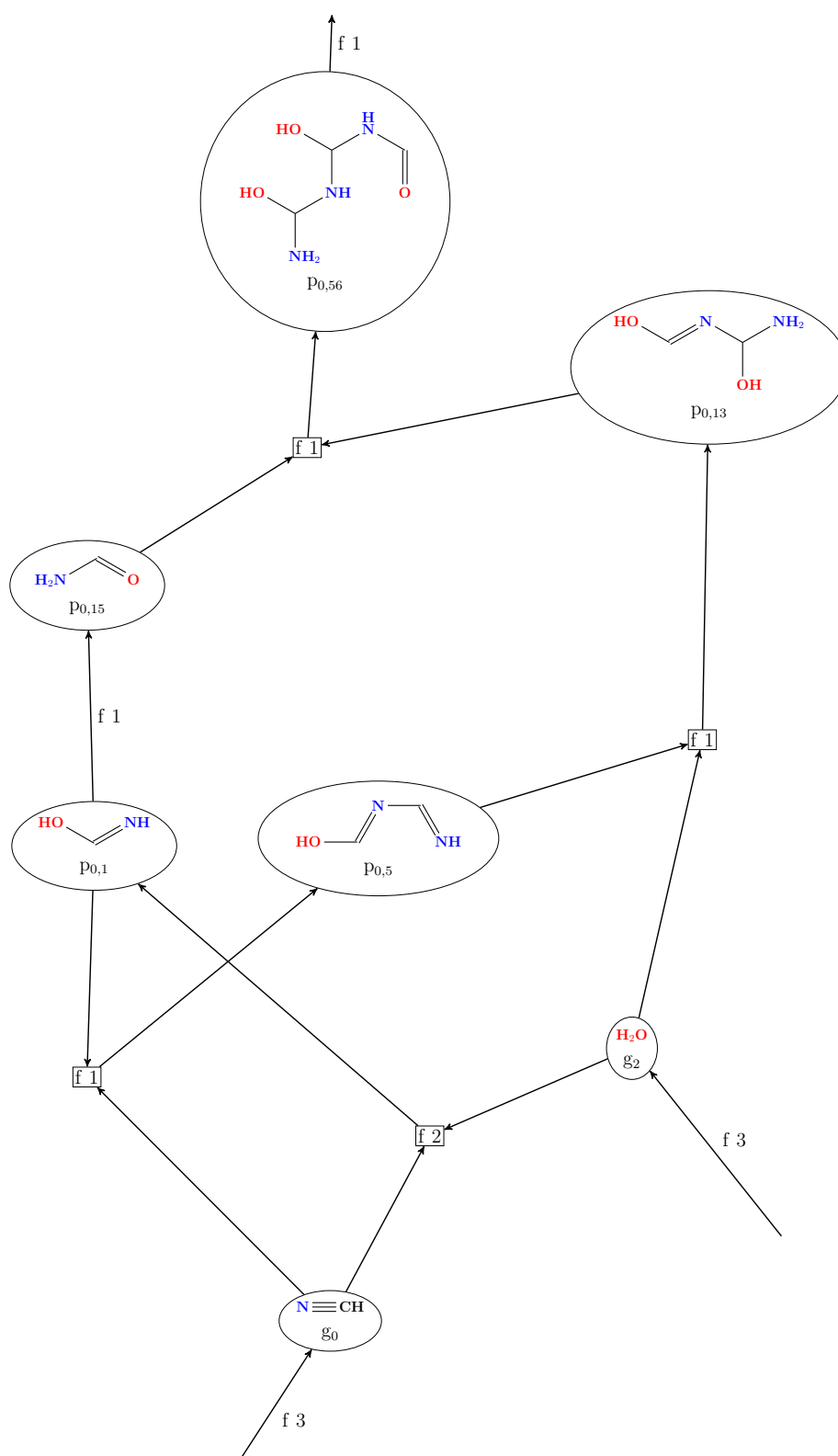
### 0.3.4 Solution 3

#### Overall Data

Objective value (non-integral): -0.118581

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	-6.000000	3
p_{0,15}	0	0	-10.625195	1.000000	2
p_{0,1}	0	0	-10.610101	1.000000	1
p_{0,56}	0	1	-31.869324	-1.076863	67
p_{0,5}	0	0	-16.158998	-6.000000	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	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	1
$p_{0,5}$	0	0	-42425.44262	-6.0	-42445.397331	2
$p_{0,13}$	0	0	-55767.391129	-6.0	-55787.345839	3
$p_{0,15}$	0	0	-27896.445756	1.0	-27893.119971	2
$p_{0,56}$	0	1	-83672.898792	-1.076863	-83676.480206	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	2	-93.957936	-93.957936
14	$g_0, p_{0,1},$	$p_{0,5},$	1	-128.091353	-128.091353
36	$p_{0,1},$	$p_{0,15},$	1	-39.628701	-39.628701
123	$g_2, p_{0,5},$	$p_{0,13},$	1	-38.114968	-38.114968
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-311.3330607072973

$$\Delta G = -39.374477366500884$$

$$\Delta E = -0.11858050026963979$$

$$|E| = 6$$

$$|U| = 5$$

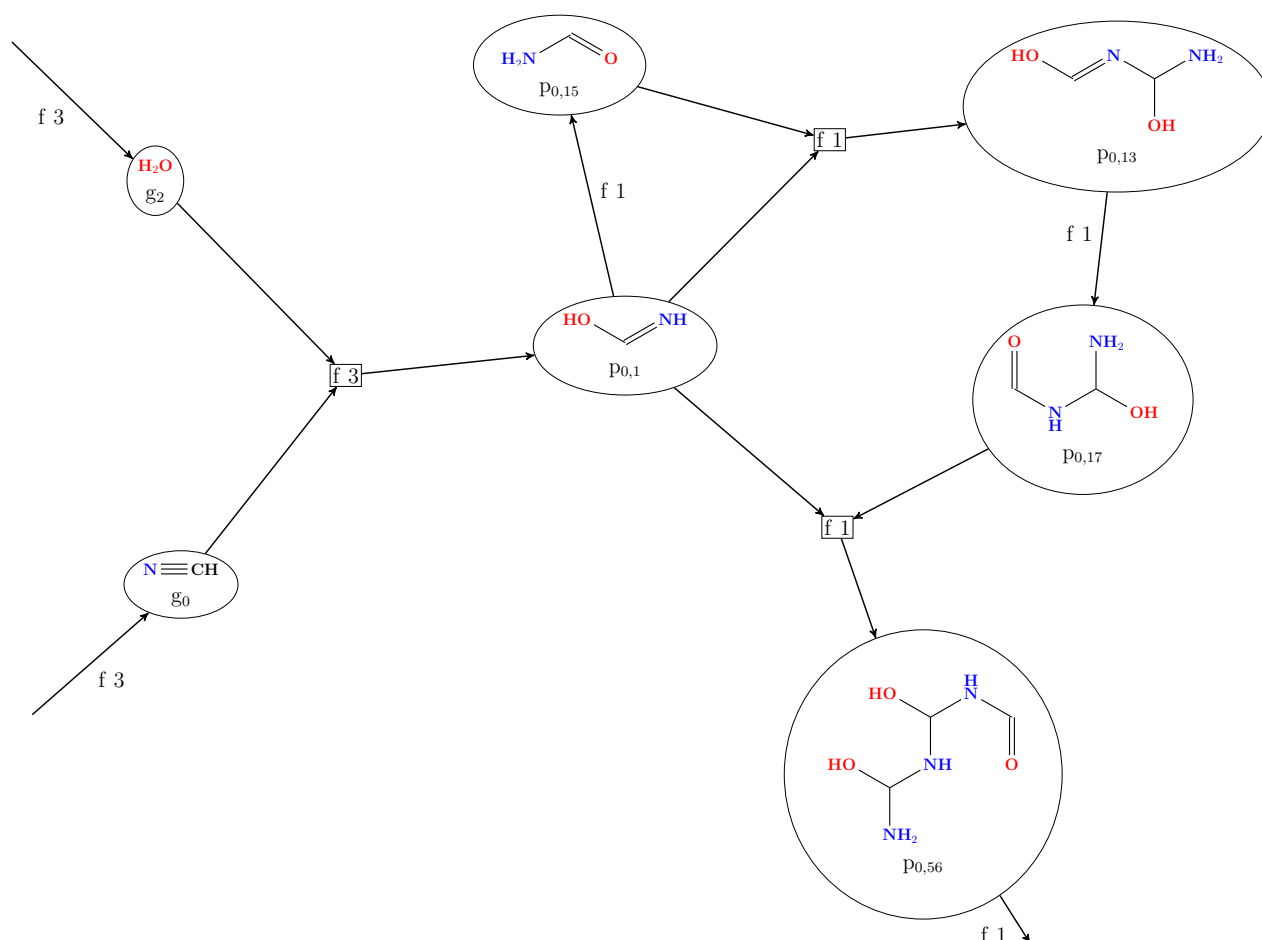
### 0.3.5 Solution 4

#### Overall Data

Objective value (non-integral): -0.0827939

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	0
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	4
$p_{\{0,15\}}$	0	0	-10.625195	-6.000000	2
$p_{\{0,17\}}$	0	0	-21.248844	-6.000000	65
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	-6.0	-13326.099672	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	1
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	4
$p_{0,15}$	0	0	-27896.445756	-6.0	-27916.400466	2
$p_{0,17}$	0	0	-55788.832737	-6.0	-55808.787447	65
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2$	$p_{0,1}$	3	-77.722278	-77.722278
36	$p_{0,1}$	$p_{0,15}$	1	-55.864359	-55.864359
192	$p_{0,1}, p_{0,15}$	$p_{0,13}$	1	-0.203974	-0.203974
196	$p_{0,1}, p_{0,17}$	$p_{0,56}$	1	-29.616135	-29.616135
250	$p_{0,13}$	$p_{0,17}$	1	-37.733087	-37.733087
Sum					-217.37530785222552

$$\Delta G = -35.65843785691816$$

$$\Delta E = -0.08279388219427763$$

$$|E| = 7$$

$$|U| = 5$$

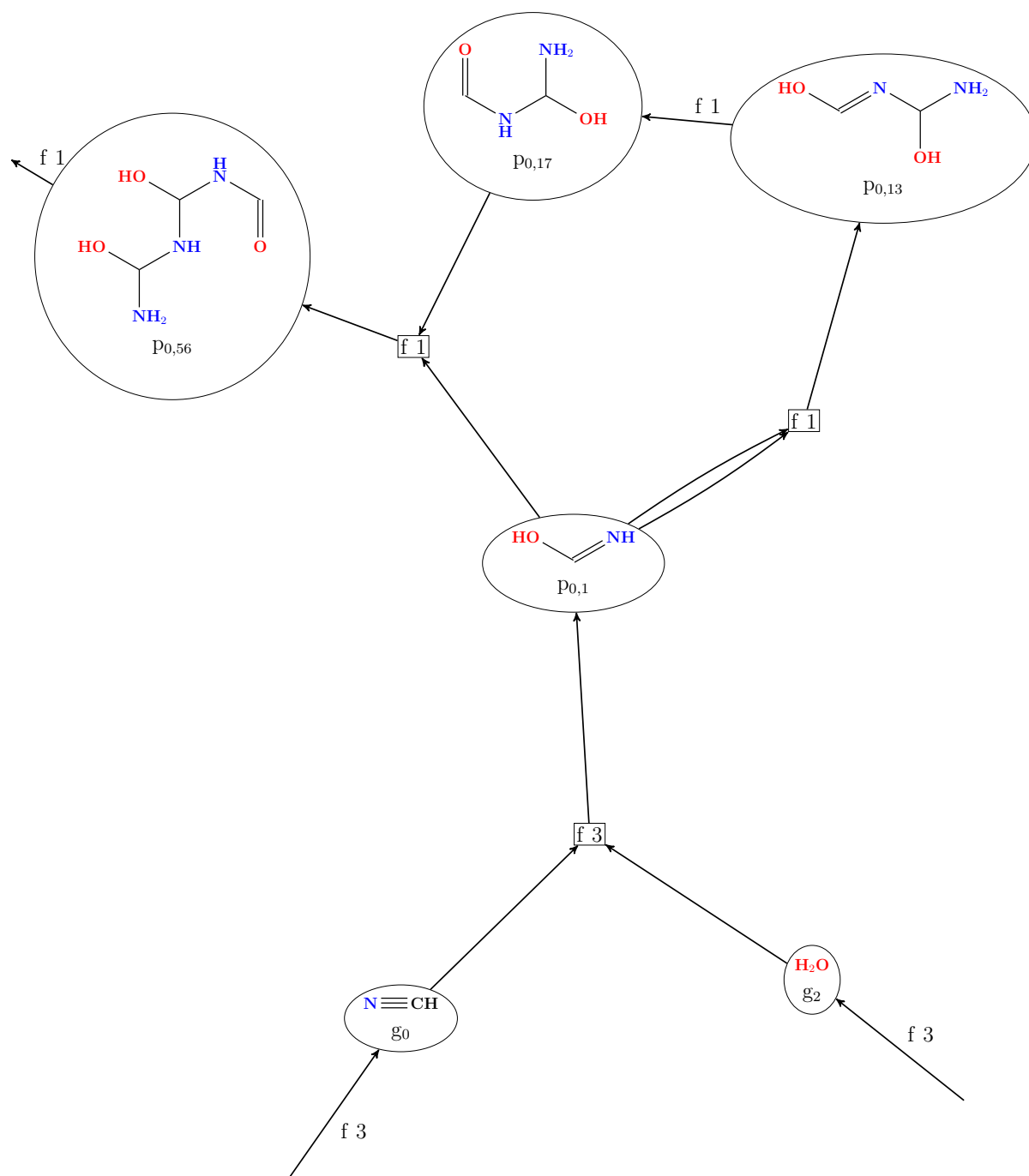
### 0.3.6 Solution 5

#### Overall Data

Objective value (non-integral): -0.0827939

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	64
$p_{\{0,17\}}$	0	0	-21.248887	1.000000	65
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	1.0	-55763.953809	64
$p_{0,17}$	0	0	-55788.944315	1.0	-55785.61853	65
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.902223	-93.902223
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-56.068333	-56.068333
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-45.684501	-45.684501
250	$p_{0,13},$	$p_{0,17},$	1	-21.664721	-21.664721
Sum					-217.37530785222415

$\Delta G = -40.5124214202443$

$\Delta E = -0.08279388219427711$

$|E| = 6$

$|U| = 4$

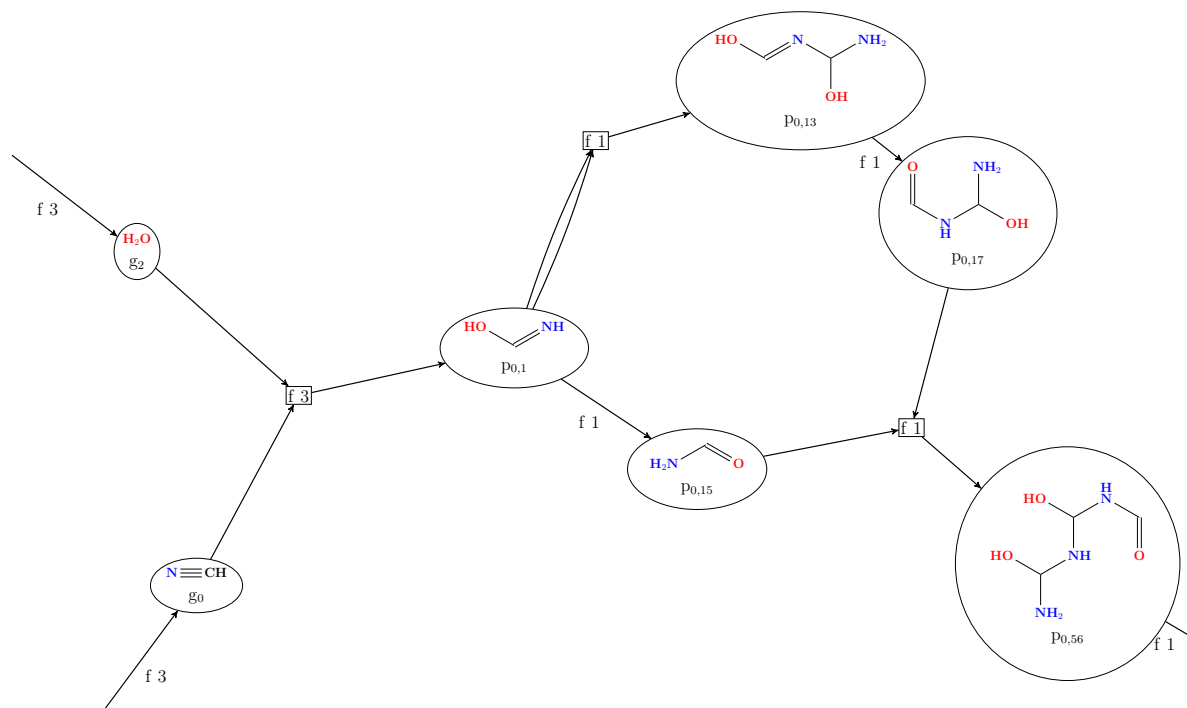
### 0.3.7 Solution 6

#### Overall Data

Objective value (non-integral): -0.0827939

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	20
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	43
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	22
$p_{\{0,17\}}$	0	0	-21.248887	1.000000	44
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	20
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	21
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	43
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	22
$p_{0,17}$	0	0	-55788.944315	1.0	-55785.61853	44
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.957936	-93.957936
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-55.956906	-55.956906
36	$p_{0,1},$	$p_{0,15},$	1	-39.572909	-39.572909
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	-6.055879	-6.055879
250	$p_{0,13},$	$p_{0,17},$	1	-21.664721	-21.664721
Sum	-217.37530785222276				

$$\Delta G = -40.51242089514438$$

$$\Delta E = -0.08279388219427658$$

$$|E| = 7$$

$$|U| = 5$$

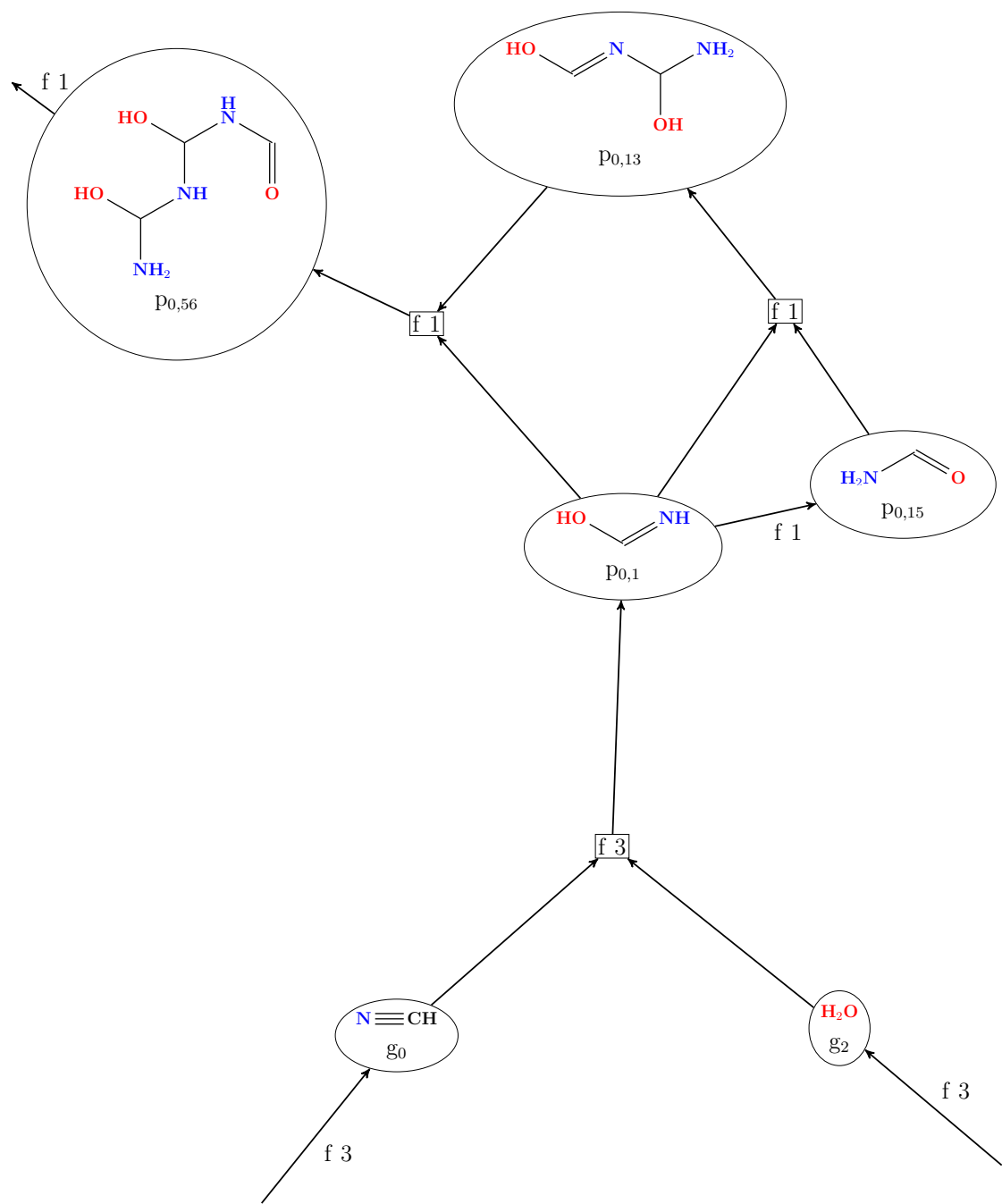
### 0.3.8 Solution 7

#### Overall Data

Objective value (non-integral): -0.0827939

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	-6.000000	45
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	22
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	-27856.817054	1.0	-27853.491269	21
$p_{0,13}$	0	0	-55767.391129	-6.0	-55787.345839	45
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	22
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.957936	-93.957936
36	$p_{0,1},$	$p_{0,15},$	1	-39.572909	-39.572909
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-32.675476	-32.675476
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-51.002029	-51.002029
Sum					-217.37530785222225

$$\Delta G = -40.51242115769434$$

$$\Delta E = -0.08279388219427639$$

$$|E| = 6$$

$$|U| = 4$$

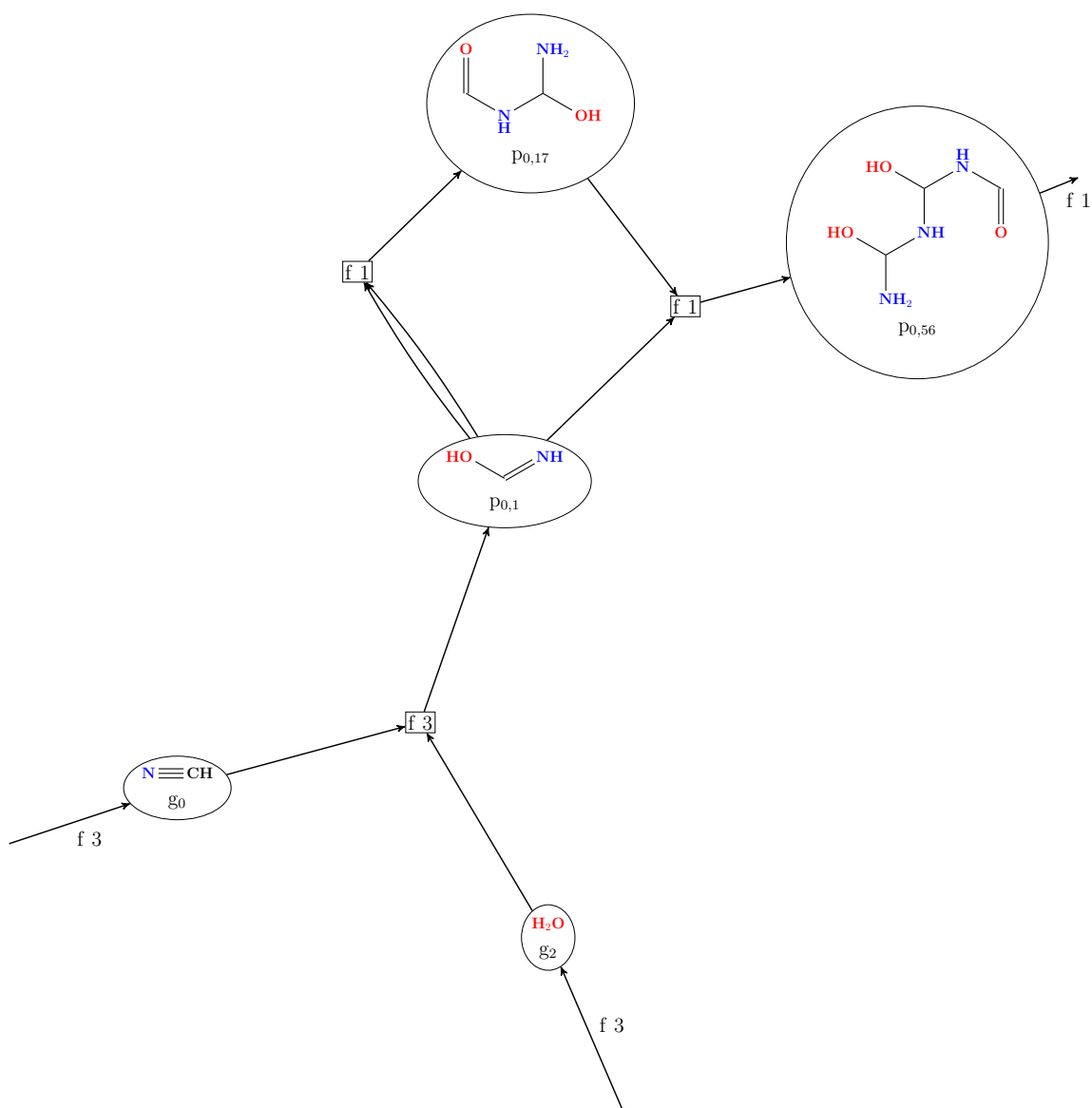
### 0.3.9 Solution 8

#### Overall Data

Objective value (non-integral): -0.0827939

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	20
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	43
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	1.0	-13302.819176	20
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	21
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	43
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.902223	-93.902223
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-77.621476	-77.621476
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-45.796079	-45.796079
Sum					-217.37530785222086

$$\Delta G = -40.5124214202443$$

$$\Delta E = -0.08279388219427586$$

$|E| = 5$   
 $|U| = 3$

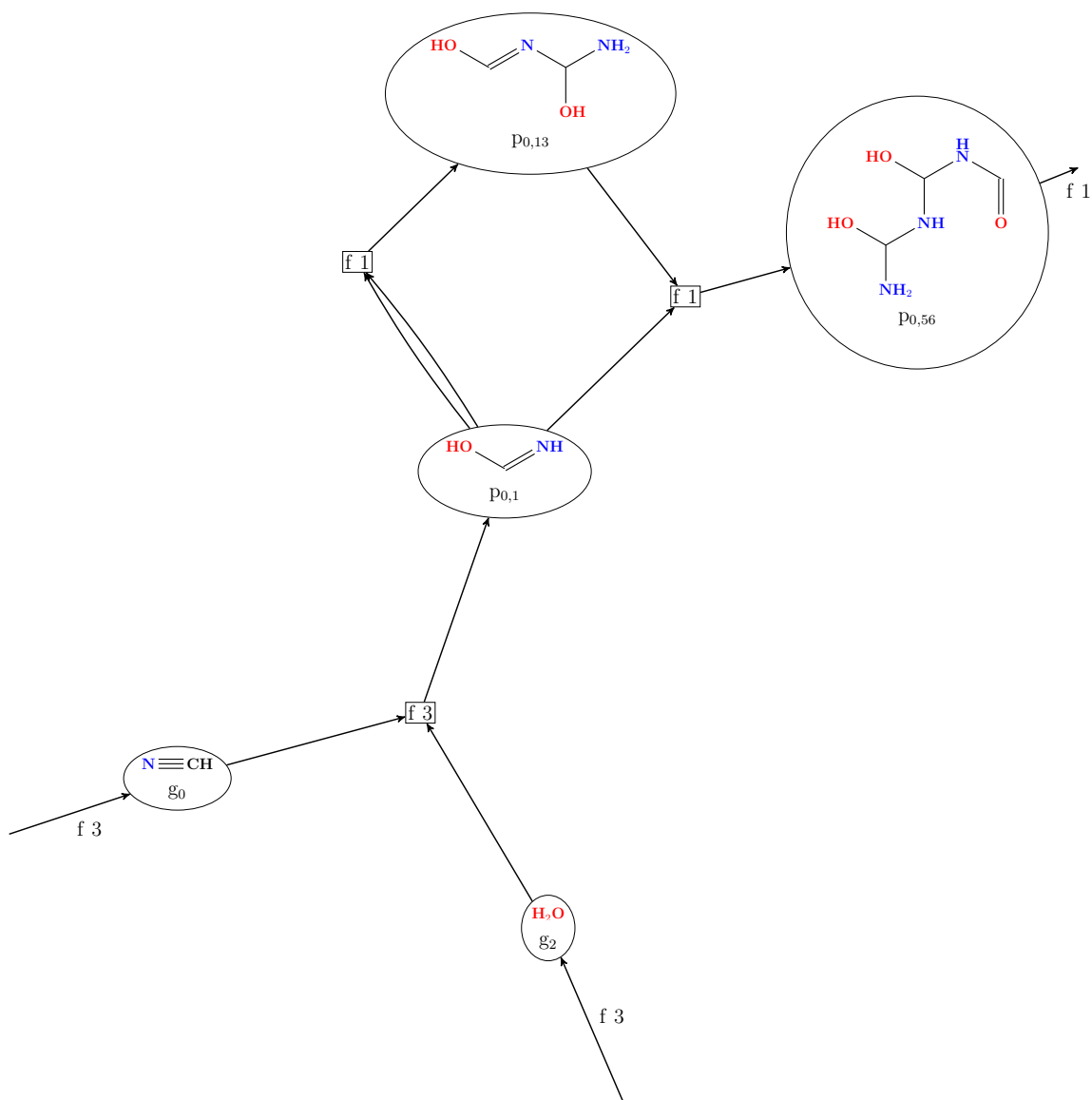
### 0.3.10 Solution 9

#### Overall Data

Objective value (non-integral): -0.0827939

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	65
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	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	1.0	-55763.953809	65
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.902223	-93.902223
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-56.068333	-56.068333
263	$p_{0,1}, p_{0,13},$	$p_{0,56},$	1	-67.349222	-67.349222
Sum					-217.37530785222086

$$\Delta G = -40.5124214202443$$

$$\Delta E = -0.08279388219427586$$

$$|E| = 5$$

$$|U| = 3$$

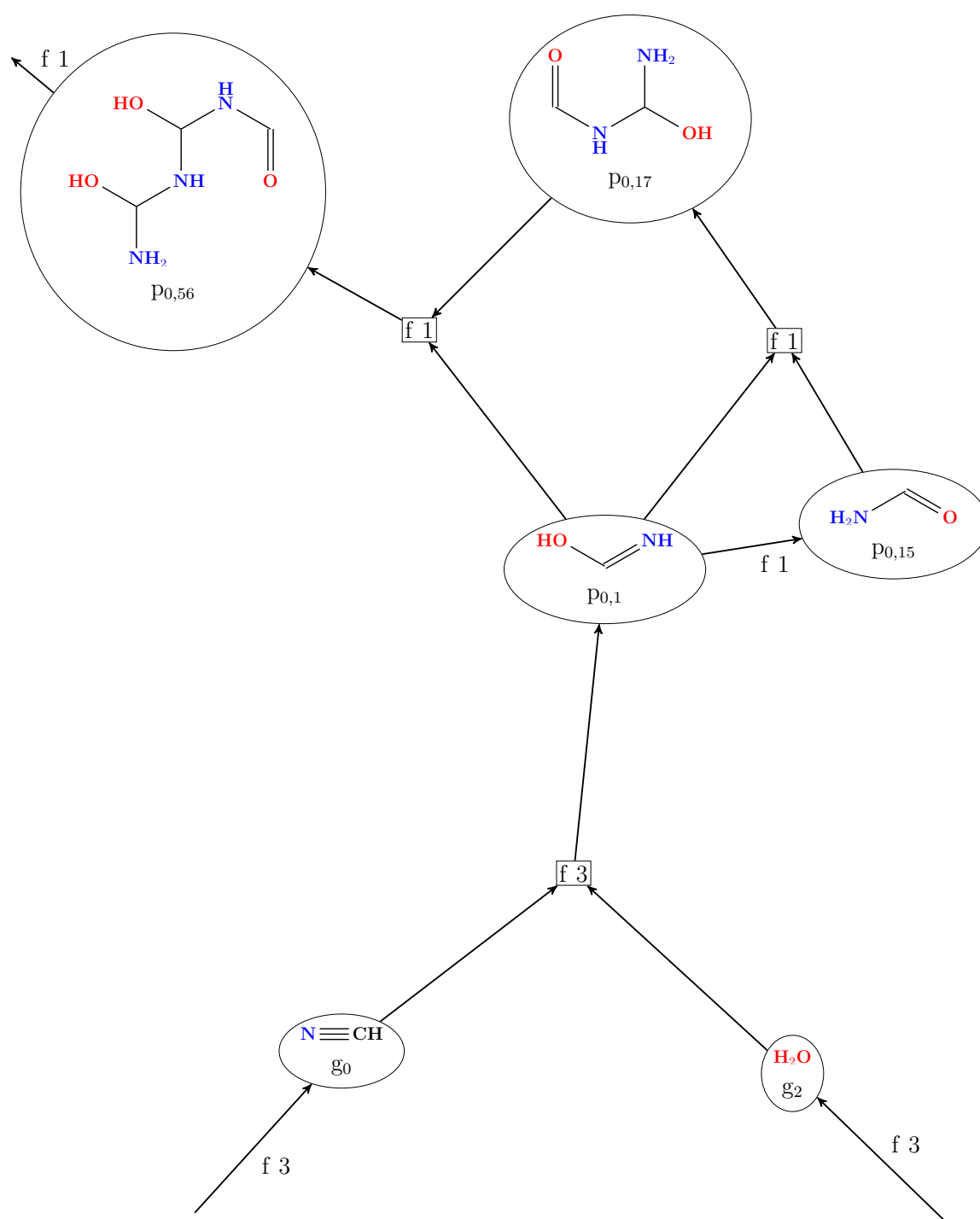
### 0.3.11 Solution 10

#### Overall Data

Objective value (non-integral): -0.0827939

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	20
$p_{\{0,15\}}$	0	0	-10.625195	-6.000000	23
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	45
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-6.0	-13326.099672	20
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	21
$p_{0,15}$	0	0	-27896.445756	-6.0	-27916.400466	23
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	45
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-77.722278	-77.722278
36	$p_{0,1},$	$p_{0,15},$	1	-55.864359	-55.864359
183	$p_{0,1}, p_{0,15},$	$p_{0,17},$	1	-21.757117	-21.757117
196	$p_{0,1}, p_{0,17},$	$p_{0,56},$	1	-45.796079	-45.796079
Sum	-217.37530785222881				

$$\Delta G = -35.6584383820181$$

$$\Delta E = -0.08279388219427888$$

$$|E| = 6$$

$$|U| = 4$$

### 0.3.12 Solution 11

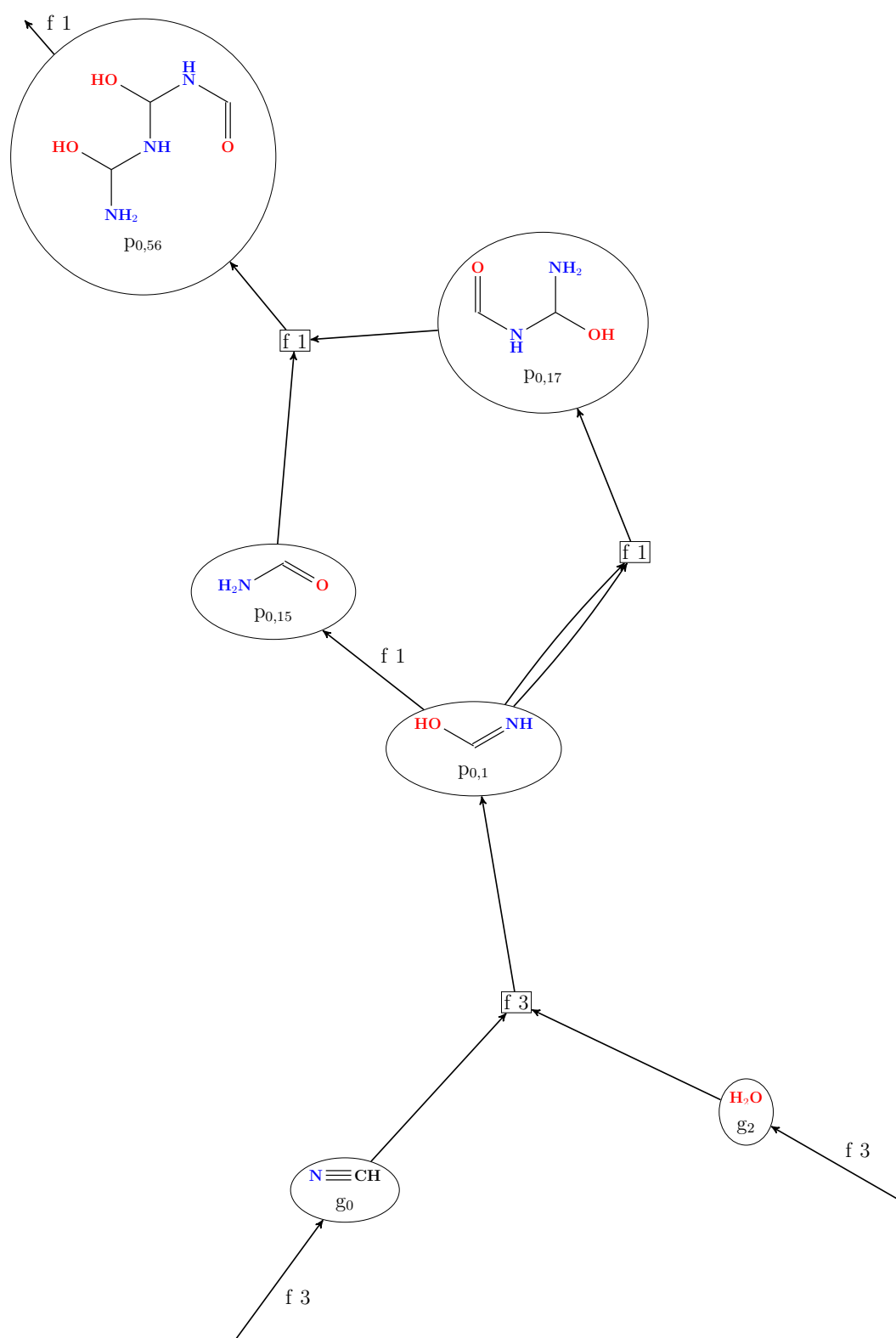
#### Overall Data

Objective value (non-integral): -0.0827939

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	0
$p_{\{0,15\}}$	0	0	-10.625195	-1.598488	22
$p_{\{0,17\}}$	0	0	-21.248887	1.000000	44
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	-6.0	-13326.099672	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	21
$p_{0,15}$	0	0	-27896.445756	-1.598488	-27901.761984	22
$p_{0,17}$	0	0	-55788.944315	1.0	-55785.61853	44
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-77.777992	-77.777992
36	$p_{0,1},$	$p_{0,15},$	1	-45.634901	-45.634901
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-77.621627	-77.621627
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-217.37530785221946

$$\Delta G = -35.6584383820181$$

$$\Delta E = -0.08279388219427533$$

$$|E| = 6$$

$$|U| = 4$$

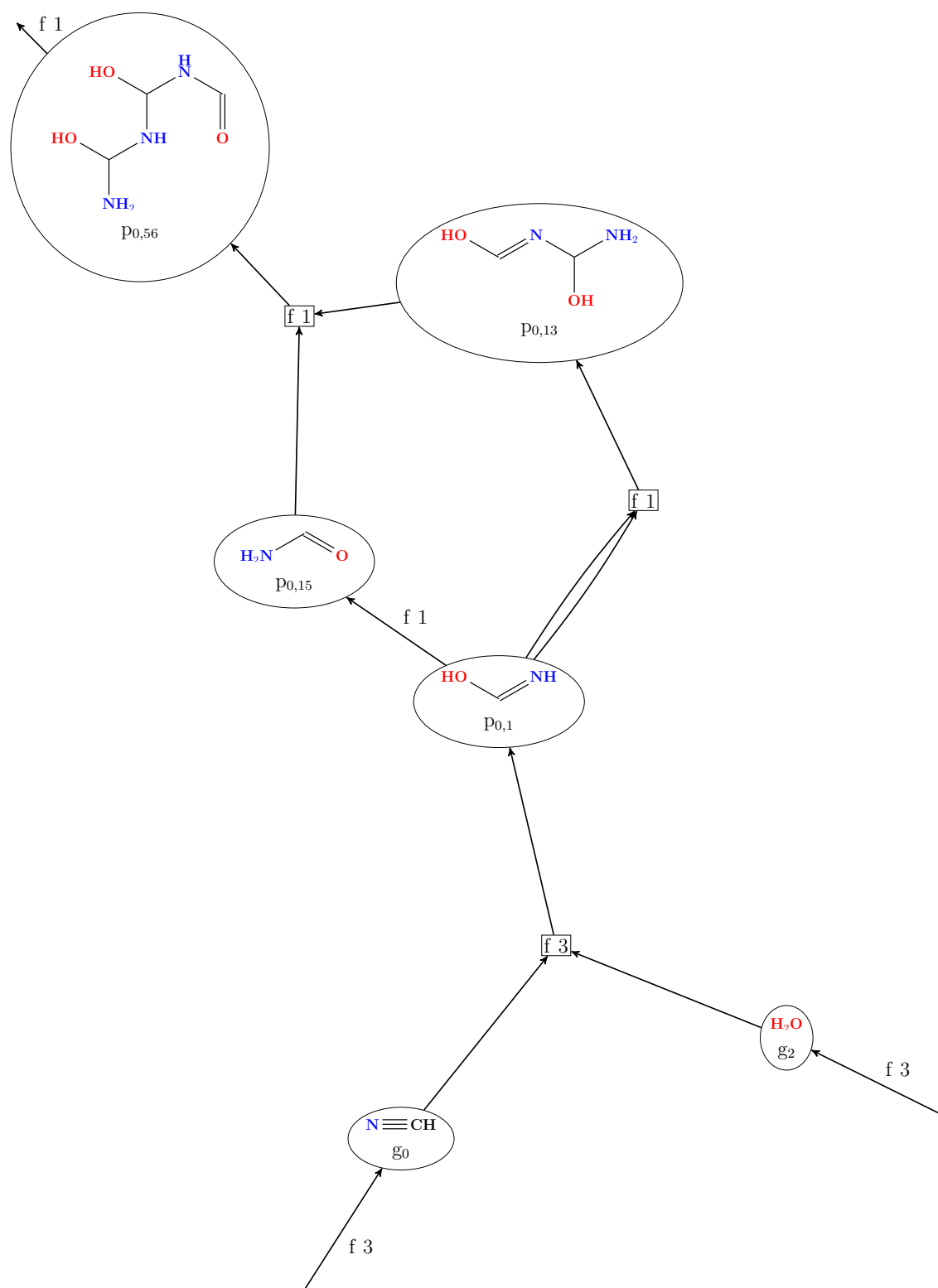
### 0.3.13 Solution 12

#### Overall Data

Objective value (non-integral): -0.0827939

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	-3.923137	3
$p_{\{0,15\}}$	0	0	-10.625195	-6.000000	2
$p_{\{0,1\}}$	0	0	-10.610101	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.817054	1.0	-27853.491269	1
$p_{0,13}$	0	0	-55767.391129	-3.923137	-55780.43864	3
$p_{0,15}$	0	0	-27896.445756	-6.0	-27916.400466	2
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.957936	-93.957936
30	$p_{0,1}, p_{0,1},$	$p_{0,13},$	1	-67.447882	-67.447882
36	$p_{0,1},$	$p_{0,15},$	1	-55.808646	-55.808646
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-217.37530785221946

$$\Delta G = -40.5124214202443$$

$$\Delta E = -0.08279388219427533$$

$$|E| = 6$$

$$|U| = 4$$

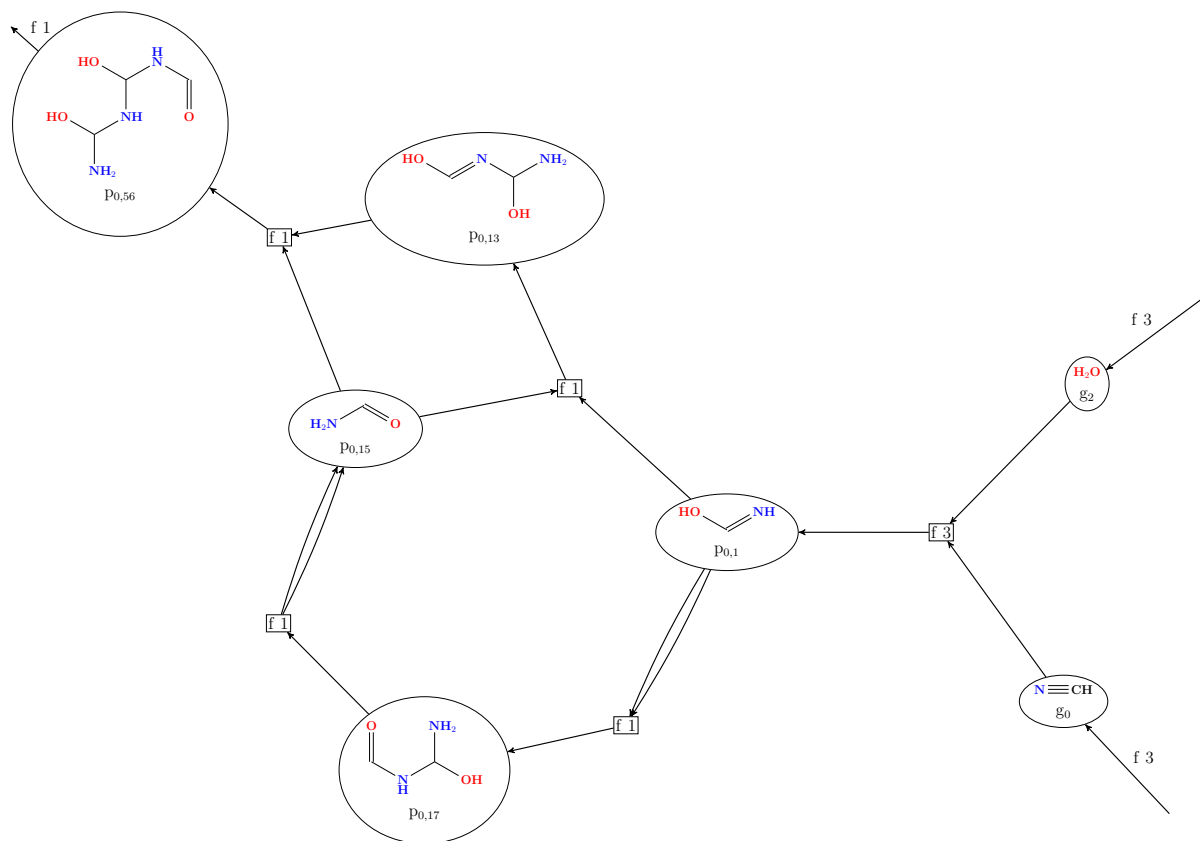
### 0.3.14 Solution 13

#### Overall Data

Objective value (non-integral): -0.0827939

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	0
$p_{\{0,13\}}$	0	0	-21.240678	-4.904048	34
$p_{\{0,15\}}$	0	0	-10.625195	-5.019089	32
$p_{\{0,17\}}$	0	0	-21.248887	-6.000000	31
$p_{\{0,1\}}$	0	0	-10.610101	-6.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-6.0	-13326.099672	0
$p_{0,1}$	0	0	-27856.817054	-6.0	-27876.771765	1
$p_{0,13}$	0	0	-55767.391129	-4.904048	-55783.700939	34
$p_{0,15}$	0	0	-27896.445756	-5.019089	-27913.138167	32
$p_{0,17}$	0	0	-55788.944315	-6.0	-55808.899025	31
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.957936	-93.957936
40	$p_{0,1}, p_{0,1},$	$p_{0,17},$	1	-61.441682	-61.441682
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	-13.281125	-13.281125
Sum					-217.37530785221895

$$\Delta G = -35.65843811946813$$

$$\Delta E = -0.08279388219427514$$

$$|E| = 7$$

$$|U| = 5$$

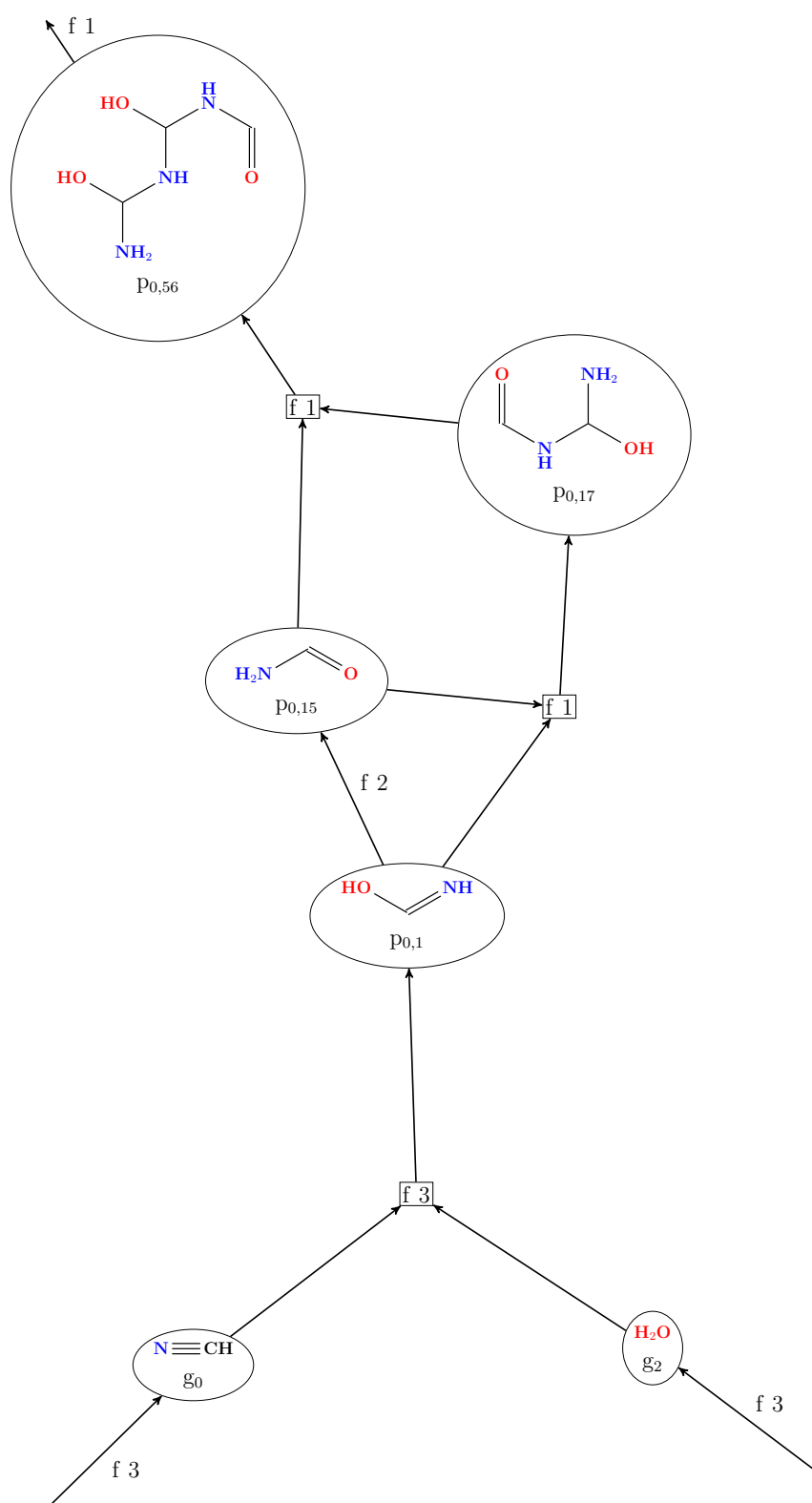
### 0.3.15 Solution 14

#### Overall Data

Objective value (non-integral): -0.0677001

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	-6.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	0
$p_{\{0,15\}}$	0	0	-10.625195	-1.646761	2
$p_{\{0,17\}}$	0	0	-21.248844	1.000000	4
$p_{\{0,1\}}$	0	0	-10.610101	-6.000000	1
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	-6.0	-14478.980288	0
$g_2$	3	0	-13306.144961	-6.0	-13326.099672	0
$p_{0,1}$	0	0	-27856.817054	-6.0	-27876.771765	1
$p_{0,15}$	0	0	-27896.445756	-1.646761	-27901.922528	2
$p_{0,17}$	0	0	-55788.832737	1.0	-55785.506952	4
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-77.777992	-77.777992
36	$p_{0,1},$	$p_{0,15},$	2	-29.566534	-29.566534
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	0.006113	0.006113
183	$p_{0,1}, p_{0,15},$	$p_{0,17},$	1	-15.583626	-15.583626
Sum	-177.7466857484337				

$$\Delta G = -30.80445508124192$$

$$\Delta E = -0.06770013717603776$$

$$|E| = 7$$

$$|U| = 4$$

### 0.3.16 Solution 15

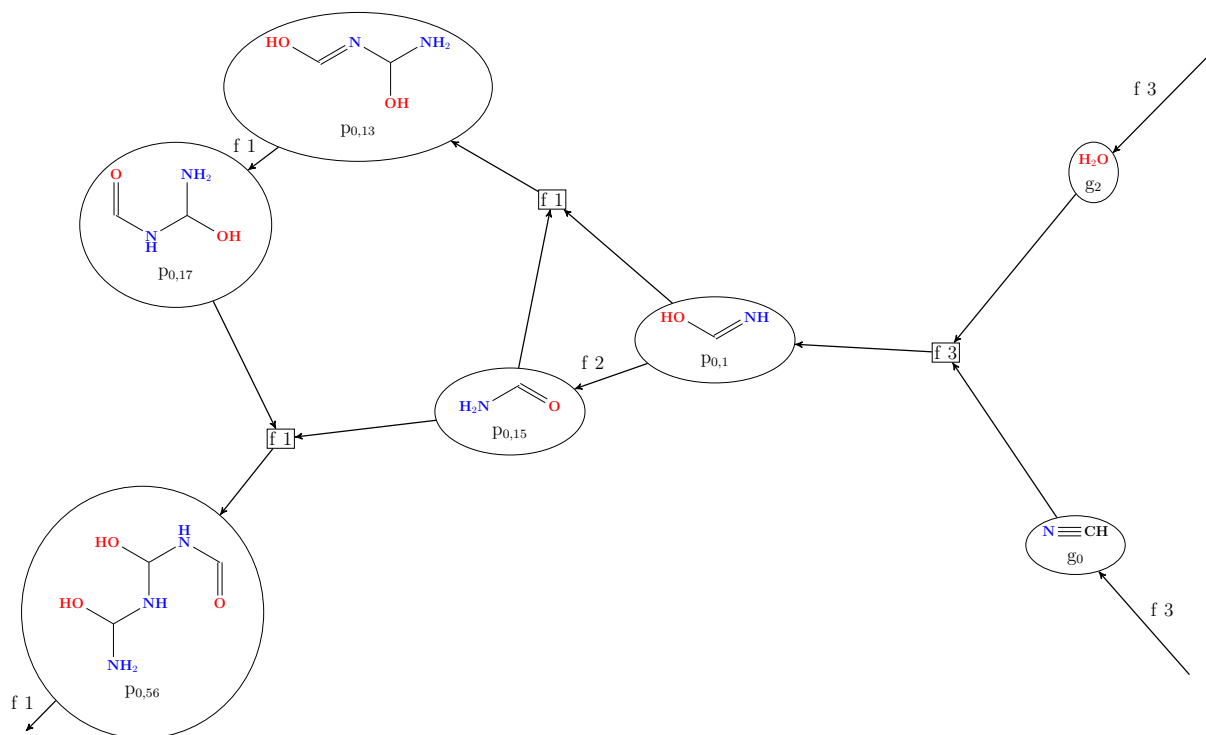
#### Overall Data

Objective value (non-integral): -0.0677001

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	0
$p_{\{0,13\}}$	0	0	-21.240635	1.000000	42
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	21
$p_{\{0,17\}}$	0	0	-21.248887	-1.619981	45
$p_{\{0,1\}}$	0	0	-10.610101	-6.000000	20
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-6.0	-13326.099672	0
$p_{0,1}$	0	0	-27856.817054	-6.0	-27876.771765	20
$p_{0,13}$	0	0	-55767.279594	1.0	-55763.953809	42
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	21
$p_{0,17}$	0	0	-55788.944315	-1.619981	-55794.332025	45
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.957936	-93.957936
36	$p_{0,1},$	$p_{0,15},$	2	-23.392964	-23.392964
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	-0.204053	-0.204053
250	$p_{0,13},$	$p_{0,17},$	1	-27.7206	-27.7206
Sum					-177.74668574843042

$$\Delta G = -35.6584375943682$$

$$\Delta E = -0.06770013717603651$$

$$|E| = 8$$

$$|U| = 5$$

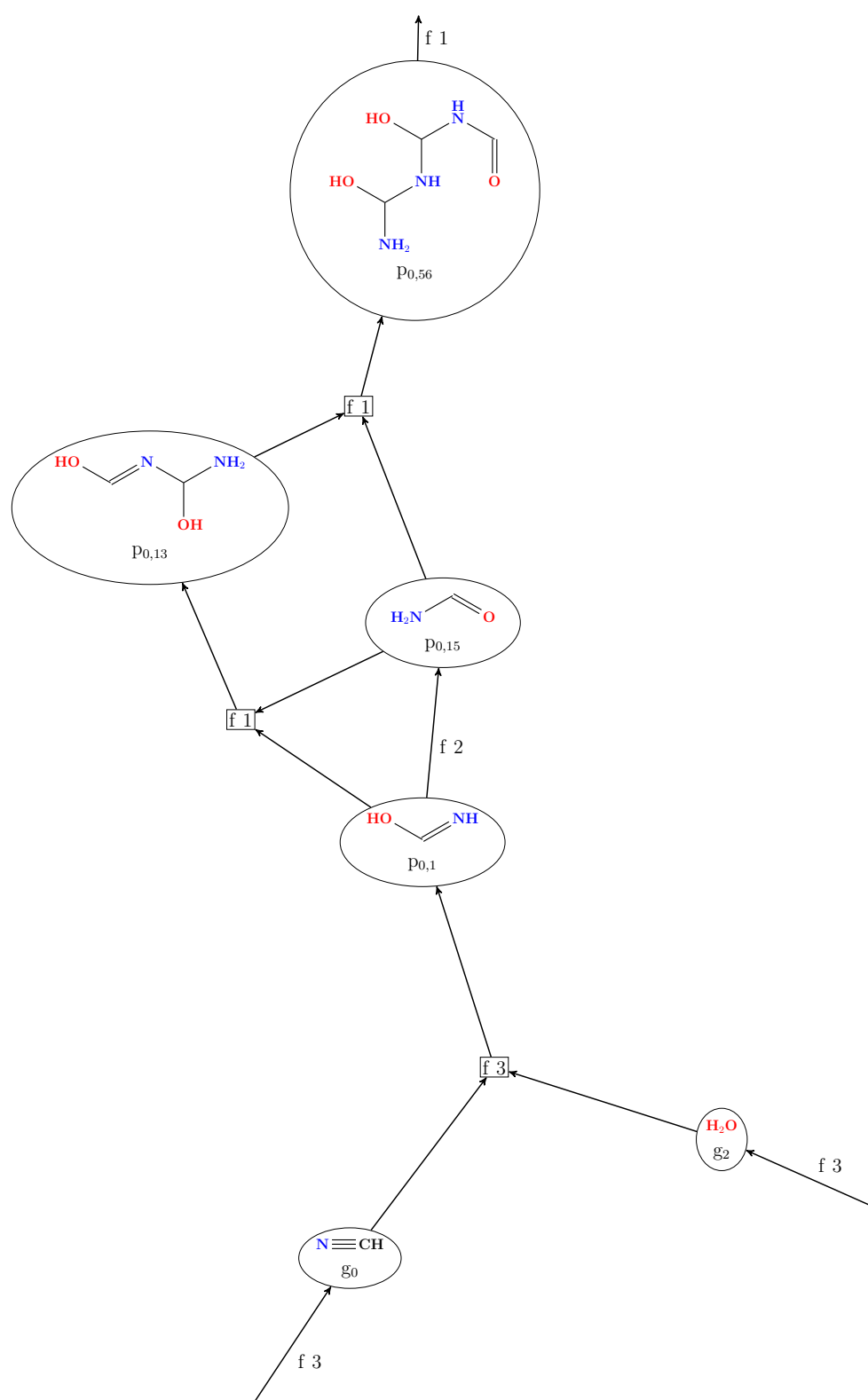
### 0.3.17 Solution 16

#### Overall Data

Objective value (non-integral): -0.0677001

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	-6.000000	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	-6.000000	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	1.0	-13302.819176	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	1
$p_{0,13}$	0	0	-55767.391129	-6.0	-55787.345839	64
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	2
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.902223	-93.902223
36	$p_{0,1},$	$p_{0,15},$	2	-39.628622	-39.628622
169	$p_{0,13}, p_{0,15},$	$p_{0,56},$	1	-11.429121	-11.429121
192	$p_{0,1}, p_{0,15},$	$p_{0,13},$	1	-32.73119	-32.73119
Sum					-177.74668574842713

$$\Delta G = -40.5124214202443$$

$$\Delta E = -0.06770013717603526$$

$$|E| = 7$$

$$|U| = 4$$

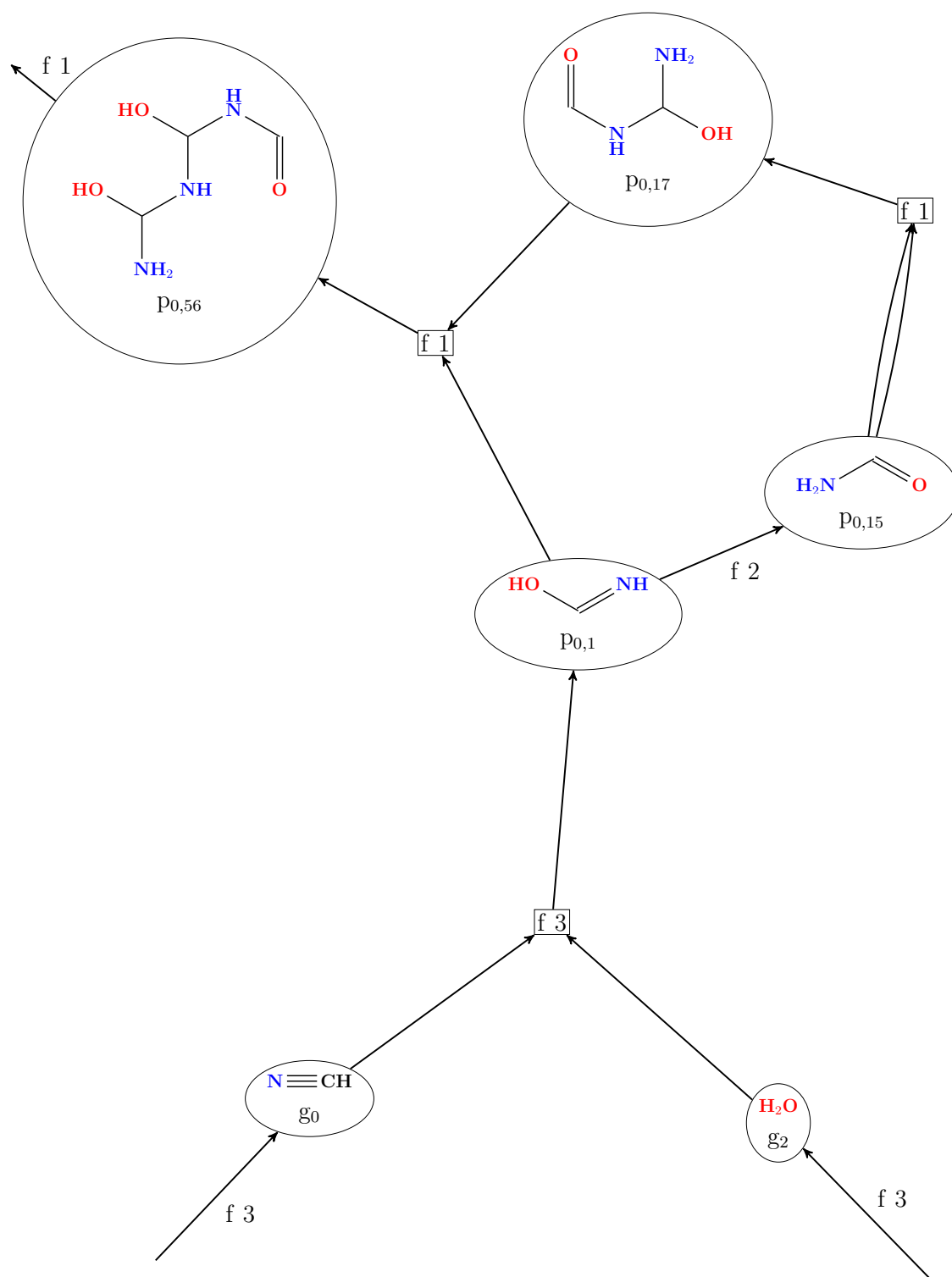
### 0.3.18 Solution 17

#### Overall Data

Objective value (non-integral): -0.0677001

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	22
$p_{\{0,17\}}$	0	0	-21.248844	0.292310	45
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	21
$p_{\{0,56\}}$	0	1	-31.869324	-6.000000	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	21
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	22
$p_{0,17}$	0	0	-55788.832737	0.29231	-55787.860575	45
$p_{0,56}$	0	1	-83672.898792	-6.0	-83692.853502	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-93.902223	-93.902223
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	-44.160311	-44.160311
Sum					-177.74668574842107

$$\Delta G = -40.51242168279427$$

$$\Delta E = -0.06770013717603296$$

$$|E| = 7$$

$$|U| = 4$$

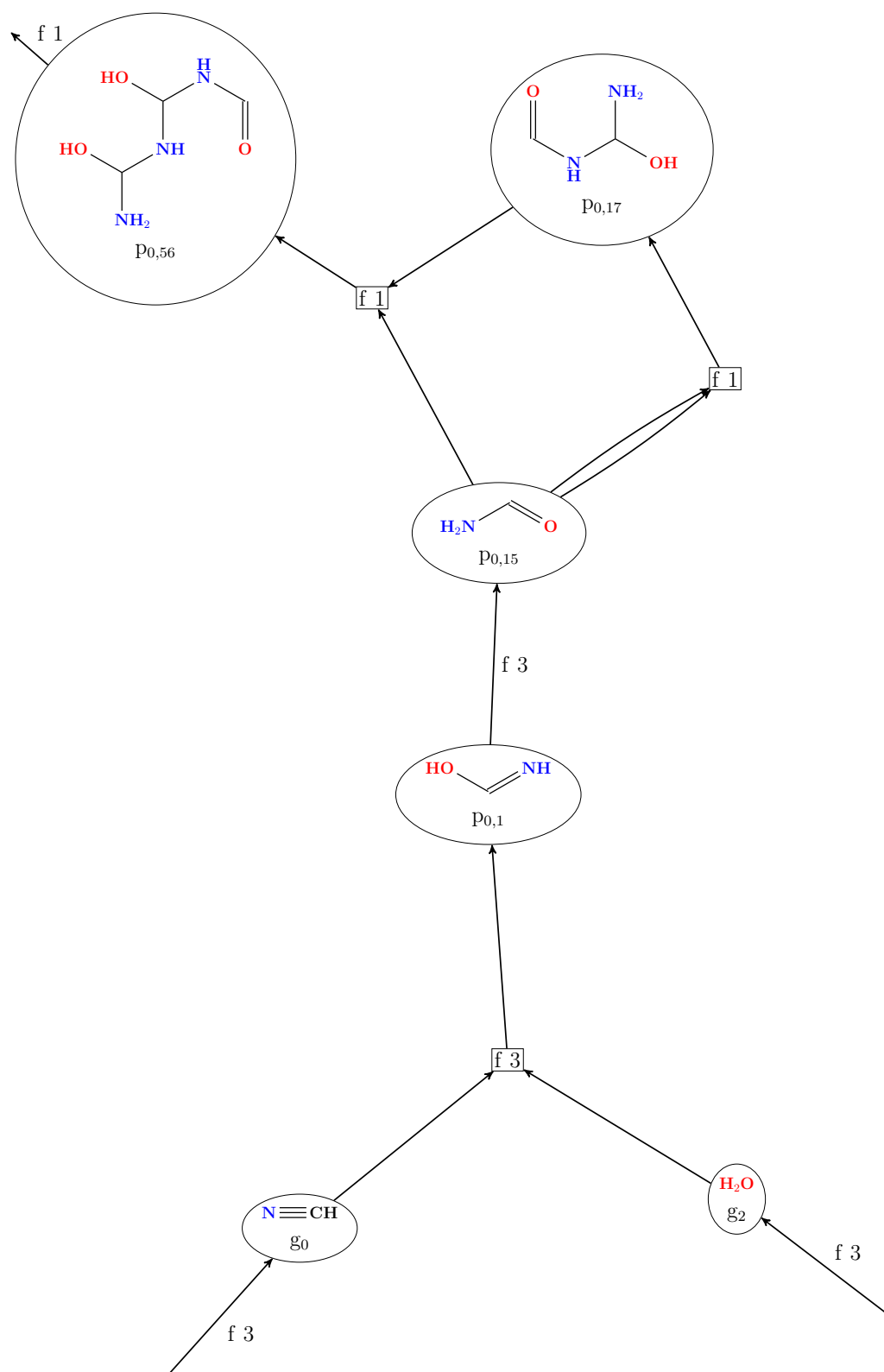
### 0.3.19 Solution 18

#### Overall Data

Objective value (non-integral): -0.0526064

Vertex/Graph	In	Out	G	logK	t_order
$g_{\{0\}}$	3	0	-5.507152	1.000000	0
$g_{\{2\}}$	3	0	-5.068043	-6.000000	0
$p_{\{0,15\}}$	0	0	-10.625174	1.000000	21
$p_{\{0,17\}}$	0	0	-21.248887	0.343228	45
$p_{\{0,1\}}$	0	0	-10.610080	1.000000	1
$p_{\{0,56\}}$	0	1	-31.869260	-4.106546	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	1.0	-14455.699793	0
$g_2$	3	0	-13306.144961	-6.0	-13326.099672	0
$p_{0,1}$	0	0	-27856.761341	1.0	-27853.435556	1
$p_{0,15}$	0	0	-27896.389963	1.0	-27893.064178	21
$p_{0,17}$	0	0	-55788.944315	0.343228	-55787.802814	45
$p_{0,56}$	0	1	-83672.731446	-4.106546	-83686.388935	67

Hyperedge	Source	Target	Flow	$x_e^{\Delta G}$	$\bar{x}_e^{\Delta G}$
6	$g_0, g_2,$	$p_{0,1},$	3	-77.722278	-77.722278
36	$p_{0,1},$	$p_{0,15},$	3	-39.628622	-39.628622
180	$p_{0,15}, p_{0,15},$	$p_{0,17},$	1	0.006113	0.006113
181	$p_{0,15}, p_{0,17},$	$p_{0,56},$	1	0.006113	0.006113
Sum					-138.11806364462598

$$\Delta G = -35.20404736021271$$

$$\Delta E = -0.05260639215779184$$

$$|E| = 8$$

$$|U| = 4$$