(2) $-C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O + 1235\,kJ$

$-g$

$$\frac{|293\,kJ|\,|1\,mole\,C_2H_5OH|\,|46\,g\,C_2H_5OH|}{|1235\,kJ|\,|1\,mole\,C_2H_5OH|}$$

(4) $\Delta H_{rxn} = n\Sigma_{prod} - n\Sigma_{react}$

$$= \left[2\left(KCl\right) + Mg_{(s)}\right] - \left(2(K) + MgCl_2\right]$$

$$= \left[2(-435.9) + 0\right] - \left[2(0) + -641.6\right]$$

(5) $\frac{0.385\ J}{g \cdot °C}$, 75 g , 150 J

Find ΔT

g °C	150 J	
0.385 J		75 g
c	q	m

5.26 ΔT

Absorbs

T_i 25°C start
\+ 5.26 ΔT
30.26°C T_f

(1)

	n	PEL	Size
s/p/d/f = 0/1/2/3	l	Azimuthal / Sublevel	Shape (l max = n−1)
(−l to +l)	m	magnetic / orbital	orientation in space
± 1/2	s	Spin	Spin

(7) $\frac{2.25\,J}{g\,^\circ C} \cdot \frac{100\,g}{mole}$

$\frac{J}{mole\,^\circ C}$

2.25 J ✓	100 g
g °C	mole

(9) $c = f\lambda$

$\frac{3\times10^{8}\,m}{sec} = f\,(280\times10^{-9}\,m)$

nano

$f = 1.07\times10^{15}\ sec^{-1}$

(10) $451\,nm$ $E = \_\_ J$

$E = hf$

$c = f\lambda$

$f = \frac{c}{\lambda}$

$E = \frac{hc}{\lambda} = \frac{(6.63\times10^{-34})(3\times10^{8})}{451\times10^{-9}\,m}$

$4.4\times10^{-19}\,J$

$J = \frac{kg\cdot m^2}{sec^2}$

(12) $E = R_H\left(\frac{1}{n_1^2} - \frac{1}{n_f^2}\right)$

$= 2.18\times10^{-18}\left(\frac{1}{5^2} - \frac{1}{2^2}\right)$

$E = -4.578\times10^{-19}\,J$

434×10^{-9}

$E = hf$, $c = f\lambda$

$\frac{E}{1} = \frac{hc}{\lambda}$

$\frac{\lambda}{1} = \frac{hc}{E} = \frac{(6.63\times10^{-34})(3\times10^{8})}{4.578\times10^{-19}}$

$\lambda = 4.34\times10^{-7}\,m$, $434\,nm$

(16) Ni^0

$[Ar]\ 4s^2 3d^8$ $\quad Ni^{+2}$ $\quad [Ar]\ 3d^8$

lose 2e−

(EC2)

$\lambda = \frac{h}{mv} = \frac{6.63 \times 10^{-34}}{(145 \times 10^{-3}\ Kg)(30)}$

$K = 10^3$

145g

Ecl

Water = Cr

100°C

20°C

$mC\Delta T = mC\Delta T$ ← (+)

$(50_g)(4.18)(T_f - 20) = (100_g)(0.448)(100 - T_f)$

$209(T_f - 20) = 44.8(100 - T_f)$

$209T_f - 4180 = 4480 - 44.8T_f$

$+44.8T_f \quad +4180 \quad +4180 \quad +44.8T_f$

$253.8T_f = 8660$

$T_f = 34.1°C$

① NaCl

② SiO_2

③ NH_4Cl