

Answers to Ch. 10 Problems

(2) Some energy isn't "concentrated" enough to do work.

(4) A, B 10.1 a) Ball A can roll down hill
 10.1 b) Ball B can roll down hill

(7) a) NO - it's an average energy
 b) yes - it's a total energy

(9) More heat is transferred in the second example due to the greater difference in temperatures.

(11) Stored E; E stored in bonds between atoms.

(14)^a Endothermic; Assuming the KBr is the system, heat flows from the water into the KBr in order to break the KBr into K^+ & Br^- ions.

(c) Exothermic; assuming the H_2SO_4 is the system, heat goes into the surroundings (the water) as bonds form between the water & the dissolved acid.

(15) (a) Energy leaves system & goes into surroundings.

(b) Energy leaves the surroundings and goes into the system.

(17) (i) the chemical you are studying is the system.

(14) (c) $\Delta E = q + w = 51 \text{ kJ} - 15 \text{ kJ} = +36 \text{ kJ}$

Answers to Ch. 10 problems

(20) $\Delta E = q + w = +45 \text{ kJ} - 29 \text{ kJ} = +16 \text{ kJ}$

(23) lower

(25) (a) $7845 \text{ cal} \times \frac{4.18 \text{ J}}{1 \text{ cal}} = 32792 \text{ J} = 32.8 \text{ kJ}$

(c) $62.142 \text{ kcal} \times \frac{4.184 \text{ kJ}}{1 \text{ kcal}} = 259.8 \text{ kJ} = 260 \text{ kJ} = 2.60 \times 10^2 \text{ kJ}$

(28) $35.2 \text{ g} = m$

$1251 \text{ J} = q$

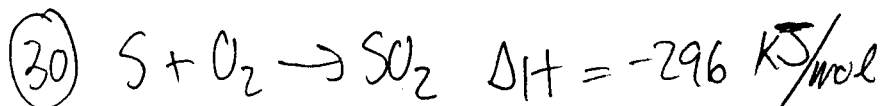
$\Delta T = 25^\circ\text{C}$

$C_p = ?$

$q = mC\Delta T$

$1251 \text{ J} = (35.2 \text{ g})(C)(25^\circ\text{C})$

$\frac{1251 \text{ J}}{(35.2 \text{ g})(25^\circ\text{C})} = 1.42 \frac{\text{J}}{\text{g}^\circ\text{C}}$



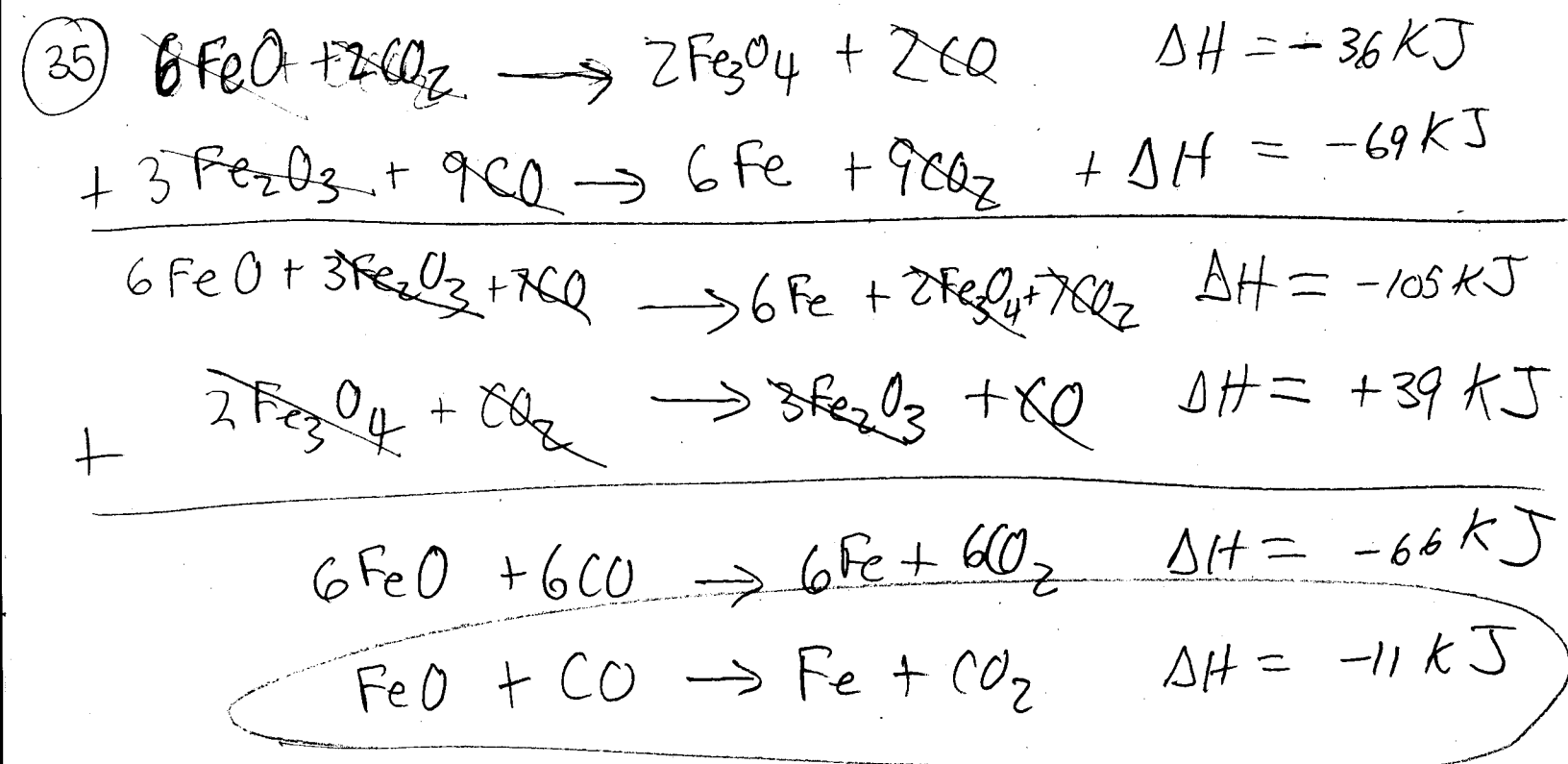
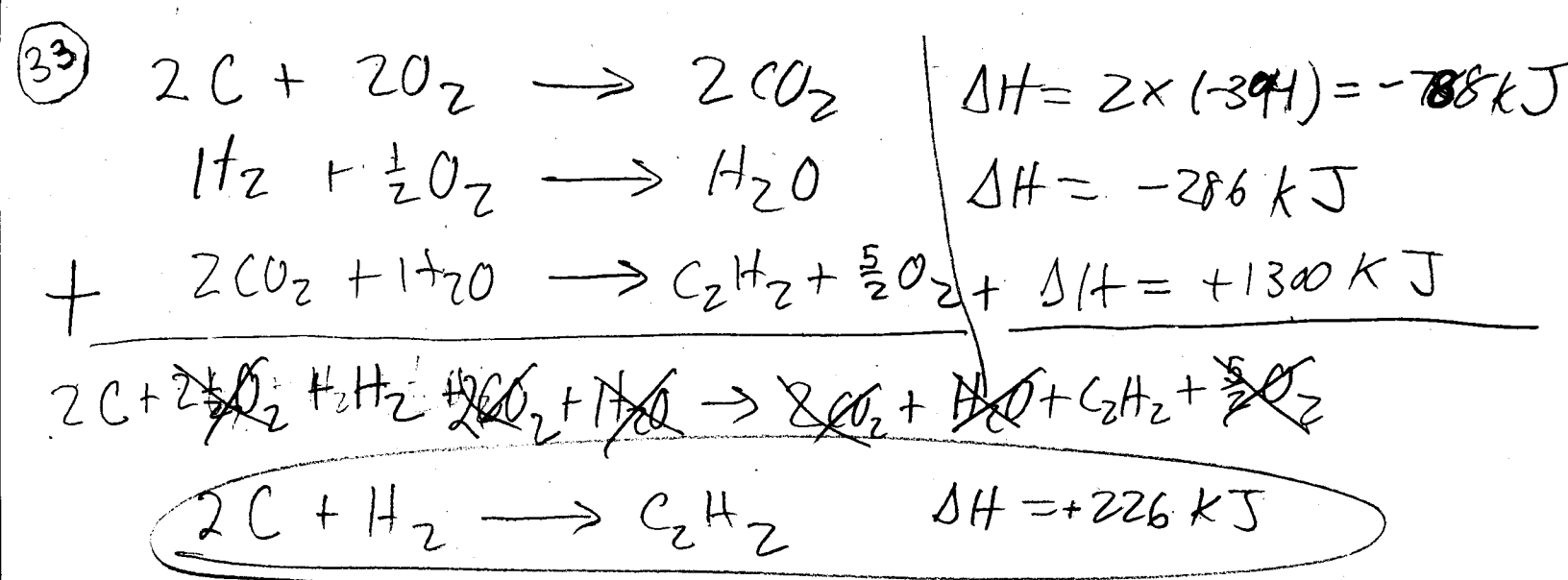
(a) $275 \text{ g} \times \frac{1 \text{ mol}}{32.06 \text{ g}} \times \frac{-296 \text{ kJ}}{1 \text{ mol}} = -2538.989 = -2540 \text{ kJ} = \Delta H$

2540 kJ of heat is released

(b) $25 \text{ mol} \times \frac{-296 \text{ kJ}}{\text{mol}} = -7400 \text{ kJ} = \Delta H$ 7400 kJ of heat are released

(c) $150. \text{ g SO}_2 \times \frac{1 \text{ mol SO}_2}{64.1 \text{ g SO}_2} \times \frac{-296 \text{ kJ}}{1 \text{ mol SO}_2} = -69.3 \text{ kJ} = \Delta H$

69.3 kJ are released



36) quality = how useful quantity = how much.
 Energy is conserved, useful energy is decreasing.

39) Greenhouse gases regulate temp. of atmosphere/planet.
 Too much greenhouse gas = too hot of a planet.

41) 1st law = E conserved. E given off by ball rolling down = E used up by reverse process.

43) "Energy spread." Heat energy released during a rxn results in a decrease of useful energy in system.