**1.**

For the reaction

2 NO(g) + O2(g) 2 NO2(g)

H= –126.0 kJ at 25C.

(a) Calculate the amount of heat transferred when 333 g of NO(g) reacts with O2(g) at 25C and 1 atm.

(b) Does this heat flow into the system or does it flow to the surroundings?

(c) Is this reaction exothermic or endothermic?

**2.**

If 8675 J of heat flows into 135.0 g of water initially at 20.0C, find the final temperature of

the water. The specific heat of water is 4.18 J g^–1 K^–1.

**3.**

Find the molecular weight of a gas if 22.24 g of the gas in a 7045 cm^3

container at 20°C exerts a pressure of 698 torr.

**CONSTANTS**

R = 0.08206 L atm mol^–1 K^–1

1 atm = 760 torr

c = 3.00 x 10^8 m/s

h = 6.63 x 10^–34 J . s

**4.**

Calculate *H*at 25C is –1790 kJ for the reaction

C3H6O(*l*) + 4O2(g) 3 CO2(g) + 3 H2O(*l*)

Given these *f* *H* values at 25C: –394 kJ/mol for CO2(g), –286 kJ/mol for H2O(*l*), and 0 for

O2(g), find *f* *H* for C3H6O(*l*).

**5.**

What volume of H2(g) at 27C and 1.08 atm is produced when

45.3 g of Al reacts as follows:

2Al + 6HNO3(aq) 2Al(NO3)3 + 3H2