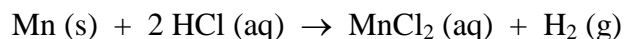


REVIEW QUESTIONS**Test 3**

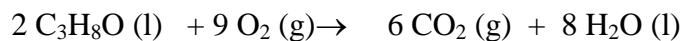
1. A cylinder with a moving piston expands from an initial volume of 0.250 L against an external pressure of 2.00 atm. The expansion does 288 J of work on the surroundings. What is the final volume of the cylinder?

2. Manganese reacts with hydrochloric acid to produce manganese (II) chloride and hydrogen gas.



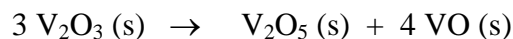
When 0.625 g of Mn is combined with enough HCl to make 100.0 mL of solution in a coffee-cup calorimeter, all of the Mn reacts, raising the temperature of the solution from 23.5°C to 28.8°C. Find ΔH_{rxn} for the reaction as written. (Assume specific heat and density of solution are the same as that of water).

3. The standard heat of reaction (ΔH°) for the reaction shown below is -1985 kJ . Based on the ΔH°_f given for each substance, determine the ΔH°_f for $\text{C}_3\text{H}_8\text{O}$.

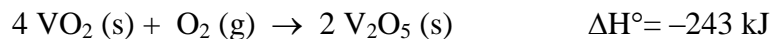
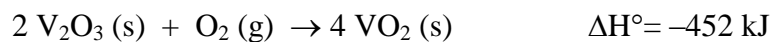
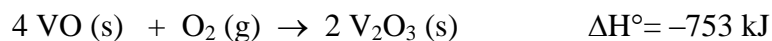


ΔH°_f (kJ/mol)	???	0	-394	-286
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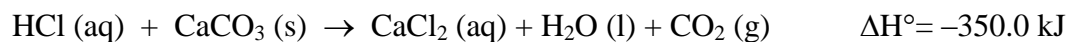
4. Find ΔH° (in kJ) for the reaction shown below:



from the following given reactions:



5. Given the heat of reaction (ΔH°) for the reaction shown below, what is ΔE° for this reaction?



6. Molybdenum metal has a threshold frequency of $1.09 \times 10^{15} \text{ s}^{-1}$ before it can emit an electron from its surface by photoelectric effect. If Mo is radiated by a light with a wavelength of 120. nm, would it emit an electron? If so, what would be the maximum velocity of the electron emitted?

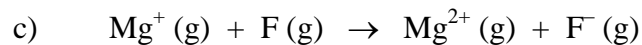
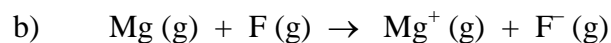
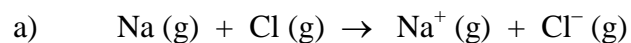
11. The electron affinities (EA) for the elements from Al to Cl (in kJ/mol) are :

Al (-44) Si (-120) P (-74) S (-200.4) Cl (-348.7)

a) What is the general trend of EA among these atoms? Explain the reason for this trend.

b) Explain why phosphorous has a lower EA than Si.

12. Using data from your textbook, calculate the change in energy expected for each of the following processes:



Answers:

1. 1.67 L
2. -195 kJ
3. -1330 kJ/mol
4. +405 kJ
5. -352.5 kJ
6. 1.43×10^6 m/s
7. 3.3×10^{-35} m
8. 4.5×10^3 m/s
9. 3.13 kJ/°C
10. -62 kJ/mol
11. No answers provided
12. a) 147 kJ b) 410 kJ c) 1122 kJ