**CHEM 102 Recitation Ch 18 Name**

**Q1**. Which change occurs with the largest increase in entropy at 25 ºC?

**(A)** HCl*(g)* + H2O*(l)* 🡪 H3O+*(aq)* + Cl–*(aq)*

**(B)** C*(graphite)* 🡪 C*(diamond)*

**(C)** H2O*(s)* 🡪 H2O*(l)*

**(D)** Br2*(l)* 🡪 Br2*(g)*

**Q2.** Which of these species has the highest entropy at 25°C?

**A)** CH3OH(*l*) **B)** H2O(*l*) **C)** MgCO3(*s*) **D)** SO(*g*) **E)** CO(*g*)

**Q3.** A process **cannot** be spontaneous if:

**A)** it is exothermic, and there is an increase in its disorder.

**B)** it is endothermic, and there is an increase in its disorder.

**C)** it is endothermic, and there is a decrease in its disorder.

**D)** it is exothermic, and there is a decrease in its disorder.

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| **Q4.** A reaction for which both **ΔS** and **ΔH** are negative is : | | | | |
| **A)** | spontaneous at high temperatures. | **C)** | spontaneous at all temperatures. | |
| **B)** | spontaneous at low temperatures. | **D)** | nonspontaneous at all temperatures. | |

**Q5.** Calculate the change in entropy for the vaporization of ethanol given that ∆Hvap of ethanol = +45.59 kJ/mol and a boiling point of 79 oC. [130 J/K mol]

**Q6.** Given the following information, calculate **∆Gº** at 25 ºC for the reaction:

**NiO*(s)* + 2 HCl*(g)* 🡪 NiCl2*(s)* + H2O*(g)***∆Hº = -122.8 kJ/mol, ∆Sº = -125.4 J/K.mol

[-85.4 kJ/mol]

**Q7.** For a certain process at 25 ºC, Δ*H* = 128.9 kJ/mol and Δ*G* = 33.5 kJ/mol. Above what minimum temperature will this process become spontaneous? [403 K]

**Q8.** Calculates Δ*G*o at 25oC of autoionization of water, H2O(*l*) → H+(*aq*) + OH─(*aq*). (*K*w=1×10-14)

[80 kJ/mol]