**Pre-lab quiz: Chemical equilibrium & Le Châtelier’s principle**

1. Assume the Haber-Bosch reaction is at chemical equilibrium.

N2(g) + 3H2(g) 🡨🡪 2NH3(g) + heat

(a) If hydrogen is added, which way would equilibrium shift?

(b) If ammonia is removed, which way would equilibrium shift?

(c) If nitrogen is removed, which way would equilibrium shift?

(d) If the temperature is increased, which way would equilibrium shift?

(e) If the pressure is decreased by doubling the volume, which way would equilibrium

shift?

2. Which way would the equilibrium of reaction (1) shift if CaCl2 solution were added? Would the change be visible? How?

3. Which way would the equilibrium of reaction (3) shift if silver nitrate (Ag(NO3)) were added? Would the change be visible? How?

4. Which way would the equilibrium of reaction (3) shift if sodium iodide (NaI) powder were added? Would the change be visible? How?