**NO₂/N₂O₄ Equilibrium**

**Objective:**
NO₂ is brown and N₂O₄ is colorless. How do temperature and pressure changes affect the position of the equilibrium below? Can you use the color of the mixture to obtain the information?

![Chemical Reaction Diagram]

**Materials:**
- 6M HNO₃
- copper powder
- hood
- test tube
- 50 mL beaker
- 5, 1mL syringe
- rubber stoppers
- 2 large beakers (300 mL)
- water
- ice
- hot plate
- Vernier LabQuest with temperature probe, gas pressure sensor, and colorimeter

When preparing samples of NO₂/N₂O₄, add a small amount of copper powder on the end of a spatula to a test tube. Cover the metal with a few drops of the nitric acid solution. A brown gas should evolve. You can cap the test tube with a stopper or septum cap. You can transfer the NO₂/N₂O₄ gas mixture with a syringe between test tube with septum caps.

**Hypothesis:**

**Procedure:**

**Data/ Observations:**

**Questions**

1. What are the characteristics of a chemical system at equilibrium?
2. Is the equilibrium between NO₂ and N₂O₄ temperature dependant?