Required Training

UC Lab Safety Fundamentals

Required PPE

Lab coat, safety glasses/goggles,
nitrile gloves

Equipment

Dropper bottles

Chemicals

0.002 M KSCN (0.19 g in 1 L DI water)

Petri dish

0.2 M Fe(NO$_3$)$_3$ (8 g Fe(NO$_3$)$_3$ · 9H$_2$O per 100 mL DI water)

Safety sheet/container for overhead projector

A few crystals of NaHPO$_4$

Procedure:

1. Place a petri dish on a clear plastic sheet or white plastic safety container on an overhead projector.
2. Cover the bottom of the petri dish with the KSCN solution.
3. Add a few drops of the Fe(NO$_3$)$_3$ solution and note the color change.
4. Add a crystal of KSCN to the dish and do not stir. Note a darker colored area around this crystal.
5. Add a drop of Fe(NO$_3$)$_3$ solution and do not stir. Note the color change.
6. Adding a few crystals of NaHPO$_4$ will clear the solution by completing the ferric ions.

Discussion:

This demonstration operates on the following reaction:

$$\text{Fe}^{3+}_{aq} + \text{SCN}^{-}_{aq} \leftrightarrow \text{FeSCN}^{2+}_{aq}$$

The local additions of either ferric ions or thiocyanate ions will each provide local color intensities by shifting the equilibrium. Iron nitrate shifts the above equation to the right, and so too does potassium thiocyanate. By complexing the available Fe$^{3+}$ ions in the solution, NaHPO$_4$ shift the reaction to the left.

Hazards:

Always wear PPE when conducting demonstrations. Potassium thiocyanate is a potential health threat if it comes in contact with the body. In the case of a spill, wash the affected area for 15 minutes.
SOP:

N/A

Disposal (by Storeroom)

Return the demonstration to the storeroom, where the waste will be collected and disposed of through EH&S.