



Atomic Structure - Airglow Demonstration (#36)

Iron III Thiocyanate Ion Equilibria

A chemical equilibrium is set up so that with the addition of either reactant, a color change will be observed when the equilibrium shifts to favor either the products or reactants.

MATERIALS

- 3% ammonium thiocyanate solution in dropper bottle
- 1% iron III chloride solution in a dropper bottle
- 1% mercury II chloride solution in dropper bottle
- 2% sodium dihydrogen phosphate solution in dropper bottle
- 5 50mL beakers labeled A,B,C,D,E
- 100mL beaker
- Squirrt bottle with D.I. water
- Stirring rod
- Overhead projector

PRESENTATION

1.
 - Place the five beakers onto the overhead projector
 - Fill all of the beakers with about 10mL of D.I. water and wait a minute for the water to become still.

- Carefully add 5 drops of 1% FeCl_3 into one side of beaker A and 5 drops of 3% NH_4SCN to the other side to show the both are colorless solutions
- Stir the solution to serve as the color standard

2.

- Add 5 drops of the solution from beaker A to beakers B,C,D, and E
- Add 5 drops of 1% FeCl_3 to beaker B and stir (color will darken)
- Add 5 drops of 3% NH_4SCN to beaker C and stir (color will darken)
- Add 1 drop of NaH_2PO_4 to beaker D and stir (color will lighten)
- Add 10 drops of HgCl_2 to beaker E and stir (color will lighten)

DISCUSSION

- Le Chatelier's principle

HAZARDS (MSDS Links)

Ammonium Thiocyanate: <http://www.sciencelab.com/msds.php?msdsId=9927080> [1]

Iron III Chloride: <https://www.sciencelab.com/msds.php?msdsId=9924033> [2]

Mercury II Chloride: <http://www.sciencelab.com/msds.php?msdsId=9924616> [3]

Sodium Dihydrogen Phosphate: <http://www.sciencelab.com/msds.php?msdsId=9925021> [4]

REFERENCES

Doris Kolb, "Introduction to Overhead Projector Demonstrations", *Journal of Chemical Education*, 1987, 64, 348.

Lee R. Summerlin and James L. Ealy, Jr., "Chemical Demonstrations: A Sourcebook for Teachers", The American Chemical Society, Washington, D.C., 1955

[Undergraduate](#) [5]

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http://www.chem.arizona.edu/lecture_demos/airglow_demo

Links:

- [1] <http://www.sciencelab.com/msds.php?msdsId=9927080>
- [2] <https://www.sciencelab.com/msds.php?msdsId=9924033>
- [3] <http://www.sciencelab.com/msds.php?msdsId=9924616>
- [4] <http://www.sciencelab.com/msds.php?msdsId=9925021>
- [5] <http://www.chem.arizona.edu/taxonomy/term/11>