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Ferrothiocyanate Fe(SCN)<sub>2</sub>: We are currently doing a prac called the *Effect of concentration changes on equilibrium yields*. I need to make up 0.0005M of Fe(SCN)<sub>2</sub> solution, but I have no protocol to make it up. Can anyone help me?

**Voting:**



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**Publication Date:** 02 August 2016

**Asked By:** Anonymous

Tags

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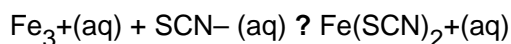
## Ferrothiocyanate Fe(SCN)<sub>2</sub>

Submitted by [Science ASSIST ...](#) on Wed, 2016-08-03 14:29

Expert Answer

Answer reviewed 22 February 2023

Iron(III) ions and thiocyanate ions react in solution to produce the complex Iron(III) thiocyanate according to the equation shown below:



pale yellow colourless blood-red

Iron(III) thiocyanate,  $\text{Fe}(\text{SCN})_2^+$  is a complex ion formed in situ and the concentration is dependent upon the state of equilibrium, which is mostly shown qualitatively rather than quantitatively. You will need a solution of KSCN, potassium thiocyanate, (as a source of  $\text{SCN}^-$  ions) and a solution of  $\text{Fe}(\text{NO}_3)_3$  or  $\text{FeCl}_3$  (as a source of  $\text{Fe}_3^+$  ions).

We suggest that you make up a 0.002M KSCN potassium thiocyanate as follows:

A 0.2M solution would contain 9.7g/500mL distilled water - dilute 1 in 100 to make 0.002M solution.

Should you require a 0.0005M solution, dilute the 0.002M solution 1 in 4.

Add a source of  $\text{Fe}_3^+$  ions to produce the iron(III) thiocyanate,  $\text{Fe}(\text{SCN})_2^+$  complex.

The following links provide useful information:

University of Illinois Chemistry Department. (nd) *Stressing an Equilibrium System by Changing the Concentration of Ions in Solution*, Retrieved (22 February 2023) from the University of Illinois at Urbana-Champaign website: <http://www.chem.uiuc.edu/chem103/equilibrium/iron.htm>

- This activity uses 0.0020M KSCN which is diluted to produce 0.0010M KSCN, to which 5 drops of 0.02 M  $\text{Fe}(\text{NO}_3)_3$  is added.

Colby college Chemistry Department, (2012) *Experiment 1 Chemical Equilibria and Le Châtelier's Principle*, Retrieved (22 February 2023) from the Colby College, Chemistry website: <https://www.colby.edu/chemistry/CH142L/Expt1.pdf>

- This is a more quantitative activity using 1.0/2.5 mL 0.0020M KSCN and 5.0 mL of 0.0020M  $\text{Fe}(\text{NO}_3)_3$  and diluted to 10mL.

Creative Chemistry. (2016) *The effect of concentration changes on equilibria*, Retrieved (22 February 2023) from the Creative Chemistry website, <https://www.creative-chemistry.org.uk/documents/N-ch2-12.pdf>

- This uses 1 drop of more concentrated solutions, using 0.5M KSCN and 0.5M  $\text{FeCl}_3$  and diluting to 5mL.

## References

Chem-Supply. (2019) *Potassium thiocyanate*, Safety Data Sheet. Search <https://shop.chemsupply.com.au/> to source the latest Safety Data Sheet via the product information page.

Chem-Supply. (2020) *Iron(III) nitrate*, Safety Data Sheet. Search <https://shop.chemsupply.com.au/> to source the latest Safety Data Sheet via the product information page.

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