

## Synthesis of ferrocenated iron oxide nanoparticles

1. Add concentrated sulfuric acid ( $1.0 \text{ cm}^3$ ) to ferrocene ( $2.00 \text{ g}$ ) to yield a mixture of ferrocenium and ferrocene. Do this experiment in a fume hood.
2. Add the mixture to water ( $5 \text{ cm}^3$ ) and stir for 30 minutes. Filter the insoluble solid out of the suspension before proceeding to the next step. The blue solution is ferrocenium.
3. Prepare a mixed solution of ferrous chloride tetrahydrate ( $1.55 \text{ g}$ ) and ferric chloride hexahydrate ( $4.15 \text{ g}$ ) in  $80 \text{ cm}^3$  de-ionized water.
4. Add the mixed solution into the blue solution of ferrocenium and then stir for 1 hour.
5. Add a saturated NaOH solution slowly until the pH of solution is 12.
6. Collect the orange precipitate by centrifugation at 4500 rpm for 20 minutes.
7. Wash the precipitate with de-ionized water. Be sure that sulfate ion is completely washed by checking with  $\text{BaCl}_2$  solution.
8. Dry orange solid at  $100 \text{ }^\circ\text{C}$  for 1 hour. Record the weight and calculate the yield of the ferrocenated iron oxide.