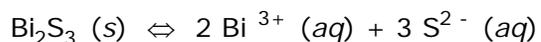


## Session #25: Homework Problems

### Problem #1

$\text{Bi}_2\text{S}_3$  dissolves in water according to the following reaction:

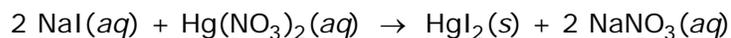


for which the solubility product,  $K_{\text{sp}}$ , has the value of  $1.6 \times 10^{-72}$  at room temperature.

- (a) At room temperature how many moles of  $\text{Bi}_2\text{S}_3$  will dissolve in  $3.091 \times 10^6$  liters of water?
- (b) How many  $\text{Bi}^{3+}$  ions will be found in the solution described in part (a)?

### Problem #2

Calculate the volume of 0.25 M NaI that would be needed to precipitate all the  $\text{Hg}^{2+}$  ion from 45 mL of a 0.10 M  $\text{Hg}(\text{NO}_3)_2$  solution according to the following reaction:



### Problem #3

- (a) Strontium fluoride,  $\text{SrF}_2$ , has a  $K_{\text{sp}}$  value in water of  $2.45 \times 10^{-9}$  at room temperature.  
Calculate the solubility of  $\text{SrF}_2$  in water. Express your answer in units of molarity.
- (b) Calculate the solubility of  $\text{SrF}_2$  in 0.03 M NaF (*aq*). Express your answer in units of molarity. Assume that NaF is completely dissociated in water.

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