• Calculate the molar solubility of $Fe(OH)_3$ in a pH = 5.0 buffer solution. The solubility product constant of $Fe(OH)_3$ is 4×10^{-38} M^4.	**Marks 2**
Answer:	

	Marks
• The molar solubility of lead(II) fluoride, PbF_2, is found to be 2.6×10^{-3} M at 25 °C. Calculate the value of K_{sp} for this compound at this temperature.	**2**
K_{sp} =	

- The pH of a solution can be controlled by adding small amounts of gaseous HCl. Assuming no change in volume, calculate what the pH of the solution must be to just dissolve 1.00 g of NiS suspended in 1.0 L of water.

  Data: $H_2S(aq) \rightleftharpoons 2H^+(aq) + S^{2-}(aq)$ $K = 1.1 \times 10^{-20}\ M^2$

  $K_{sp}(NiS) = 1.0 \times 10^{-22}\ M^2$

Marks 5

pH =

Marks 6

- A champagne bottle is filled with 750 mL of wine, leaving 10.0 mL of air at atmospheric pressure when it is sealed with a cork. After fermentation, the pressure inside the bottle is 6.0 atm at 20 ^{o}C. Assume that the gas produced is entirely CO_2 and that its solubility in the wine is the same as in water. What mass of CO_2 has been produced by the fermentation?
  Data: The mole fraction solubility of CO_2 in water is 7.1×10^{-4} at 293 K and 1.0 atm.

Answer:

After the bottle has been opened and all of the bubbles have been released, what volume of CO_2 has escaped? Assume all the CO_2 produced escapes.

Answer:

	Marks
• The solubility of BaF_2 in water is 1.30 g L^{-1}. Calculate the solubility product for BaF_2.	**2**
Answer:	

	Marks
• A mixture of NaCl (5.0 g) and $AgNO_3$ (5.0 g) was added to 1.0 L of water. What are the concentrations of $Ag^+(aq)$, $Cl^-(aq)$ and $Na^+(aq)$ ions in solution after equilibrium has been established? $K_{sp}(AgCl) = 1.8 \times 10^{-10}$.	**3**
$[Ag^+(aq)]$ =	$[Cl^-(aq)]$ =	$[Na^+(aq)]$ =