SCH 4U
K_{sp} Test

1. Using the K_{sp} value for PbI_2 found in the attached table, calculate:

    a) the solubility in mol/L for PbI_2

    b) the concentration of Pb^{2+} ion in a saturated solution of lead iodide in parts per million (Note: Parts per million or p.p.m. is a common unit for expressing small amounts of solute, ionic or otherwise. The unit p.p.m is a short form of the composite unit mg/L)

2.   Determine the $[Ag^{1+}]$ in M needed to just begin precipitate
      formation in a solution that has an carbonate ion
      concentration equal to 0.0001 M (i.e. $[CO_3^{2-}]$ = 0.0001 M)

3.   Calculate the K_{sp} value for $Fe(OH)_3$ given that the solubility
      of ferric hydroxide is 2.17 x 10^{-10} mol/L. *Use the table of
      K_{sp} values for confirmation purposes only*.

4.   Determine the solubility of $CaCO_3$ in a solution of 0.100 M Na_2CO_3.   Given your answer, determine the mass of $CaCO_3$ in mg that would be required to saturated 750 mL of the sodium carbonate solution.

5.   Calculate the mass of precipitate in mg that you would expect to form when 250 mL of 0.0006 M Na_2SO_4 is added to 500 mL of 0.00024 M $Pb(NO_3)_2$. May I suggest use of a table for your solution.

SOLUBILITY PRODUCT CONSTANTS

$AgC_2H_3O_2$	2.5×10^{-3}	FeS	3.7×10^{-19}
AgBr	7.7×10^{-13}	*Fe(OH)₃*	*6.0×10^{-38}*
Ag_2CO_3	8.2×10^{-12}	HgS	3×10^{-53}
AgCl	1.8×10^{-10}	$MgCO_3$	2.5×10^{-5}
Ag_2CrO_4	1.1×10^{-12}	MgC_2O_4	8.6×10^{-5}
AgCN	2.0×10^{-12}	$Mg(OH)_2$	9.0×10^{-12}
AgI	8.3×10^{-17}	MnS	1.4×10^{-15}
Ag_2S	1.6×10^{-49}	NiS	1.8×10^{-21}
$Al(OH)_3$	3×10^{-33}	$PbCl_2$	1.6×10^{-5}
$BaCO_3$	4.9×10^{-9}	$PbCrO_4$	1.8×10^{-14}
$BaCrO_4$	1.2×10^{-10}	$Pb(IO_3)_2$	2.6×10^{-13}
$BaSO_4$	1.5×10^{-9}	PbI_2	7.1×10^{-9}
$CaCO_3$	4.8×10^{-9}	$PbSO_4$	1.6×10^{-8}
CaC_2O_4	2.3×10^{-9}	PbS	8.4×10^{-28}
CaF_2	4.9×10^{-11}	$SrCO_3$	7×10^{-10}
$CaSO_4$	2.6×10^{-5}	$SrCrO_4$	3.6×10^{-5}
CdS	1.0×10^{-28}	$SrSO_4$	7.6×10^{-7}
CoS	1.0×10^{-21}	TlBr	3.6×10^{-6}
CuCl	3.2×10^{-7}	TlCl	1.9×10^{-4}
$Cu(OH)_2$	1.6×10^{-19}	TlI	8.9×10^{-8}
CuS	8.5×10^{-45}	$Zn(OH)_2$	2×10^{-14}
Cu_2S	1.6×10^{-48}	ZnS	4.5×10^{-24}