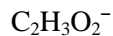


### Answers to 4.28

a) Write net ionic equations for the precipitation reaction(s) that occur(s).

Solutions are mixed to initially have 0.2 mol  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$ , 0.1 mol  $\text{Na}_2\text{S}$ , and 0.1 mol  $\text{CaCl}_2$ .

Ions that are present in solution initially must be:

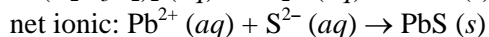
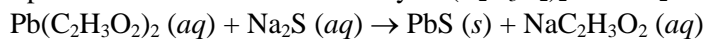


All the possible insoluble compounds that could be formed from any combinations of these are:

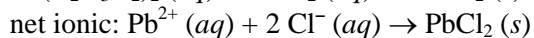
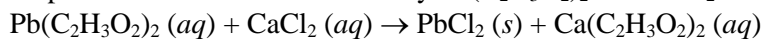


All the other compounds ( $\text{CaS}$ ,  $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2$ ,  $\text{NaCl}$ , and  $\text{NaC}_2\text{H}_3\text{O}_2$ ) are all soluble

$\text{PbS}$  precipitate must have been formed by  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$  and  $\text{Na}_2\text{S}$  reacting:



$\text{PbCl}_2$  precipitate must have been formed by  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$  and  $\text{CaCl}_2$  reacting:



b) What are the spectator ions in the solution?

These are the ions that don't react:  $\text{C}_2\text{H}_3\text{O}_2^-$ ,  $\text{Na}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{Cl}^-$