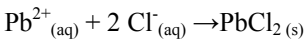
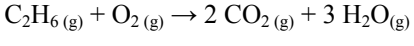
Practice Questions Section 4.1

Factors Influencing Reaction Rate - Nature of Reactants

1. Which one of the following reactions would you expect to be fastest at room temperature and why?



2. Consider the following reactions. Which do you predict will occur most rapidly at room conditions? Slowest?



Practice Questions Section 4.1

Factors Influencing Reaction Rate - Nature of Reactants Answers

1. Which one of the following reactions would you expect to be fastest at room temperature and why?

	SOLUTION
$Pb^{2+}_{(aq)} + 2\ Cl^{-}_{(aq)} \rightarrow PbCl_{2\ (s)}$	fastest - ions in aqueous solution react very quickly; all are in the same phase
$Pb_{(s)} + Cl_{2\ (g)} \rightarrow PbCl_{2\ (s)}$	slower - one of the reactants is a solid

2. Consider the following reactions. Which do you predict will occur most rapidly at room conditions? Slowest?

	SOLUTION
$C_2H_{6\ (g)} + O_{2\ (g)} \rightarrow 2\ CO_{2\ (g)} + 3\ H_2O_{(g)}$	slow due to covalent bonding (unless the reaction is highly exothermic)
$Fe_{(s)} + O_{2\ (g)} \rightarrow Fe_2O_{3\ (s)}$	slowest - solid reactant (Fe); this reaction describes the rusting of iron
$H_2O_{(l)} + CO_{2\ (g)} \rightarrow H_2CO_{3\ (g)}$	slow due to covalent bonding
$2\ Fe^{3+}_{(aq)} + Sn^{2+}_{(aq)} \rightarrow 2\ Fe^{2+}_{(aq)} + Sn^{4+}_{(aq)}$	fastest - ions in solution react very quickly