

## Answers to Exercise 9.2 Intermolecular Forces

1.

System	IMF: ion-ion	IMF: ion-dipole	IMF: ion- induced dipole	IMF: hydrogen bonding	IMF: dipole- dipole	IMF: dipole- induced dipole	IMF: induced dipole- induced dipole
NaNO <sub>3</sub> (aq)	√	√	√	√	√	√	√
<p>Rationale:</p> <p>In this system, the dominant intermolecular forces will likely be ion – dipole forces as the Na<sup>+</sup> and NO<sub>3</sub><sup>-</sup> ions are solvated by the polar water molecules.</p>							
Cl <sub>2</sub> (l)							√
<p>Rationale:</p> <p>As the only intermolecular forces present in a sample of nonpolar material, induced dipole – induced dipole forces are dominant in liquid Cl<sub>2</sub>.</p>							
I <sub>2</sub> in EtOH				√	√	√	√
<p>Rationale:</p> <p>Hydrogen bonding between ethanol molecules will be the dominant intermolecular forces in this system as hydrogen bonds are typically stronger than other dipole – dipole forces due to the small size of the hydrogen atom and the strong polarization of the O – H bond.</p>							