

# Understanding Air Quality and Monitoring

Table 2-2. Summary of characteristics of fine and coarse particulate matter (adapted from Seinfeld and Pandis, 1998).<sup>11</sup>

| PM <sub>2.5</sub> Fine Particles  | PM <sub>10</sub> Coarse Particles  |
|---|--|
| <b>Chemical Process</b> <i>How the particles are formed</i>   |  |
| Reaction, nucleation, condensation, coagulation, cloud/fog processing   | Suspension of dust or sea salt, mechanical process   |
| <b>Sources</b> <i>Where the particles come from</i>   |  |
| <ul style="list-style-type: none"> <li>Coal Combustion</li> <li>Gasoline Combustion</li> <li>Diesel Combustion</li> <li>Wood Combustion</li> <li>Motor Vehicles</li> <li>Industry</li> <li>Fires</li> <li>Gas to Particle Conversion</li> </ul> | <ul style="list-style-type: none"> <li>Industrial Dust</li> <li>Farming Dust</li> <li>Mining Dust</li> <li>Unpaved Roads</li> <li>Biological Sources</li> <li>Construction/Demolition</li> <li>Ocean Spray</li> <li>Road Salt</li> </ul> |
| <b>Composition</b> <i>What the particles are made of</i>  |  |
| <ul style="list-style-type: none"> <li>Sulfates and Nitrates</li> <li>Elemental Carbon</li> <li>Other Organics</li> <li>Water</li> <li>Metals</li> </ul>  | <ul style="list-style-type: none"> <li>Crustal Elements</li> <li>Salt</li> <li>Pollen</li> <li>Mold</li> <li>Plant and Animal Debris</li> </ul>  |
| <b>Formation</b> <i>When the particles are formed</i>   |  |
| Primary (directly emitted) and Secondary (formed in the atmosphere)   | Primary (directly emitted)   |
| <b>Atmospheric Lifetime</b> <i>How long the particles stay in the air</i>   |  |
| Days to Weeks   | Minutes to Days  |
| <b>Travel Distance</b> <i>How far the particles travel</i>  |  |
| 100 to 1000+ km (about 60 to over 600 miles)  | Generally < 100 km (< about 60 miles)  |

