

SECTION OVERVIEW

6.2: Atomization Sources

There are a variety of strategies that can be used to create atoms from molecular substances. The three main methods involve the use of a **flame**, a device known as a **graphite furnace** or a **plasma**. These three atomization methods are commonly used with liquid samples. While there are various plasma devices that have been developed, only the most common one – the inductively coupled plasma – will be discussed herein. Some specialized techniques that have been designed for especially important elements (e.g., mercury, arsenic) will be described as well. Since many samples do not come in liquid form (e.g., soils, sludges, foods, plant matter), liquid samples suitable for introduction into flames, furnace or plasma instruments are often obtained by digestion of the sample. Digestion usually involves heating the sample in concentrated acids to solubilize the metal species. Digestion can be done in an appropriate vessel on a hotplate or using a microwave oven. Microwave digesters are specialized instruments designed to measure the temperature and pressure in sealed chambers so that the digestion is completed under optimal conditions. In some cases it is desirable to measure a sample its solid form. There are arc or spark sources that can be used for the analysis of solid samples.

6.2A: Flames

6.2B: Electrothermal Atomization – Graphite Furnace

6.2C: Specialized Atomization Methods

6.2D: Inductively Coupled Plasma

6.2E: Arcs and Sparks

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