

1.3: Chemistry and the Environment

Where do scientists dump garbage? Where should scientists put unwanted waste materials, after they have made what they want? For many years, scientists simply dumped the waste into the nearest lake, river, or empty spot of ground, with no second thoughts. However, as scientists learn more about the effects of chemicals on living systems, they have become more concerned about the effects of dumping. In many cases, scientists did not know what the long-term effects would be. Today, dumping is generally illegal, and offenders pay heavy penalties of fines and jail sentences.

Environment

Many chemicals that were once commonly used were later found out to be harmful to the **environment**, to human health, or to both. The element lead was once a common additive to gasoline and to paint. Plumbing pipes were once typically made of lead. Only since the 1970s has the danger of lead become apparent. It causes brain damage; small children (who often chewed on objects painted with lead-based paint) are particularly susceptible. The use of lead in gasoline, paint, and plumbing pipes is now banned; new materials are being developed to replace hazardous lead components.

Lead is still widely used in car batteries. In recent years, battery **recycling** has become common – about 98% of car batteries are recycled today. The used batteries go to a processing plant where they are crushed and placed in a tank. The lead sinks to the bottom and can be separated, and melted. The plastic can then be used in a number of applications. The battery acids are treated with chemicals to neutralize them before they are disposed of.



Figure 1.3.1: Batteries for recycling.

How Chemists Help the Environment

Chemists are involved in all aspects of environmental protection. In the case of lead, chemists measured the amount of lead in soil, paint, plumbing, blood, and other materials. Chemists studied the chemical processes in the body to see how lead did its damage. Methods for removal of lead from the body were developed with the help of chemists. New gasoline products were developed that fostered fuel efficiency and smooth running of engines, without the presence of lead.

Chemists continue to look for threats to our health and the environment – and to search for alternatives – so that harmful chemicals can be replaced with others that will do the job as effectively, but without the harm.

Summary

- Many chemicals that were once commonly used were later found out to be harmful to the **environment**, to human health, or to both.
- Lead contamination has serious harmful effects on the body.
- Chemists contribute in many ways to helping with issues of lead contamination.

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