



Crystal Chemistry

By Verrill M. Norwood III

Crystals are found in many different places on the earth and are essential to our existence. We use them to pave roads and erect buildings and to make cars, buses, and electronic devices. We wear them as jewelry, and eat the crystals found in our foods, such as ordinary table salt or sugar. When they are ground up into a powder, such as talc, we can apply them to our skin. In fact, the vast majority of all solids are crystalline. Sometimes the crystals are too small to see.

Just what are crystals, anyway? Crystals are a special kind of solid material where the molecules fit together in a pattern that keeps repeating itself, like tiles on a kitchen floor. Because of these patterns, crystals form all sorts of unique shapes. For example, sugar crystals are oblong and slanted at the ends; salt crystals are little cubes. Read the article, "The Salt of the Earth," from the 2017 NCW edition of *Celebrating Chemistry* to learn how salt crystals form.

One way we can tell different minerals apart is by what crystal shape they are — especially the angles formed by the different flat surfaces, called "faces." Crystals form when the liquid rock from inside the earth cools and slowly hardens. Sometimes crystals form when liquids underground find their way into cracks and slowly deposit minerals.

Other times, minerals form in spaces where there is a lot of room, so they don't have a crystal shape. When there is just a big piece of a mineral, it is called a **massive mineral**. If there is a definite shape with easy-to-see flat sides, it is called a crystalline mineral. Examine some of the rocks you have collected. If you see sparkly, flat surfaces, you have found a crystal!

The great news is that if you're interested in learning more about crystals, you don't need expensive chemicals or laboratory equipment. In fact, you don't have to go any farther than your kitchen cupboard, garage, backyard, or playground to begin your exploration of the crystalline world. Although most mineral crystals take thousands of years to "grow," some like salt (halite) can form so quickly that you can watch them grow at home! Go to the Educational Resources web page at www.acs.org/ncw for more information.

Verrill Norwood III, Ph.D. is an Associate Professor of Chemistry at Cleveland State Community College in Cleveland, TN.

References

- "inChemistry" (November/December 2014)
<https://inchemistry.acs.org/content/dam/inchemistry/magazine/nov-dec-2014-issue.pdf>