

Remember your codes:

! This is important V I knew that ? I have a question X This is different from what I thought

Is It Poison?

The detective stared at the small vial of white powder on his desk. It had come from a crime scene, and it was his job to figure out what the powder was. Was it a poison?

He would run tests to find out the properties of the powder. The problem was, he only had a small amount. He would have to think carefully about how to use it.

Physical Properties

He could do some things without messing up the powder for future tests. He could observe the color. He could weigh it and figure out its density. He could even heat it up to find out its melting point. After all, when something melts, the molecules stay the same. They just move faster and become a liquid. Once he removed the heat, it would cool down and become a solid again.

Properties like color, density, melting point, and boiling point can be tested without changing the molecule involved. These are called *physical properties*. He tested the physical properties first, because those tests and observations would not change the powder.

Chemical Properties

Afterwards, he tested another group of properties. He checked to see how the powder reacted with other chemicals. He tried mixing it with an acid to look for bubbles. He put some in a candle flame to observe its response to burning. He exposed it to radiation to look for changes.

Because each of these tests involved chemical reactions, the atoms rearranged and made something new. Properties that you can only discover by changing the molecule are called *chemical properties*. Each time he tested the chemical properties of a bit of powder, he used up some of his powder. Fortunately, he completed the tests he needed before he ran out. He compared his results to lists of properties of known powders.

This powder was ground-up kitty litter. Nobody was in danger from this stuff!