

# Mineral Identification

## Property 6: Hardness

October 23, 2009

### SUMMARY

Hardness is a property of minerals. It remains consistent for every sample of a mineral. The hardness of a mineral depends on the strength of the atom's bonds. Hardness is measured using the Mohs scale.

- Hardness is a measure of a mineral's resistance to being scratched.
- The resistance comes from the strength of the bonds of the atoms in the mineral and the mineral's crystal structure.
  - If the atoms' bonds are strong = high resistance to being scratched.
  - If the atoms' bonds are weak = low resistance to being scratched.
- There are three rules to finding the hardness of a mineral:
  - If mineral A can scratch mineral B, mineral A is harder than mineral B.
  - If mineral A is scratched by mineral B, mineral B is harder than mineral A.
  - If mineral A and B both scratch each other, A and B have the same hardness.
- The Mohs Scale was created to measure the hardness of minerals.
  - The scale is relative. This means it is used to compare minerals to each other. It does not give the *exact* value of hardness.
  - The scale ranges from 1-10. A mineral with a hardness of 1 is easily scratched by other minerals. A mineral with a hardness of 10 is very resistant to being scratched. In fact, it can only be scratched by another mineral with a hardness of 10.
  - The scale ranks 10 common minerals.
  - There are everyday objects you can use to find the hardness of a mineral. Your fingernail has a hardness of 2.5, a copper penny has a hardness of about 3, glass is 5.5, and a steel nail is about 6.5.
- Examples of finding hardness:
  - Let's say you have an unknown mineral. You can scratch it with your fingernail, but the mineral cannot scratch your nail. Therefore, you know it is less than 2.5.
  - You have an unknown mineral. The mineral can scratch your fingernail, a penny, glass, but not a steel nail. Therefore, you know that it has a hardness between 5.5 and 6.5
  - You have an unknown mineral. It can scratch topaz and topaz can scratch it. Therefore, it has a hardness of 8.

A vertical chart titled 'Mohs Hardness Scale' showing the relative hardness of 10 minerals. The scale is numbered 1 to 10 from bottom to top. Each number is accompanied by a small image of the mineral and its name.

10	Diamond
9	Corundum
8	Topaz
7	Quartz
6	Orthoclase
5	Apatite
4	Fluorite
3	Calcite
2	Gypsum
1	Talc