Mineral Identification

Specimen source: Quarry, Franklin County, Massachusetts

Specimen photo: Clear crystal, no matrix

A mineral is,"*a naturally occurring, inorganic, crystalline solid, with definite chemical composition and physical properties.* "

A crystal's color and shape are often helpful in identifying a mineral species. However, many minerals present in multiple crystal habits and several different colors.

This study sheet focuses on the easily observed physical properties of a mineral specimen.

Determine Specific Gravity:

Method: http://www.johnbetts-fineminerals.com/jhbnyc/articles/specific_gravity.htm

Weight with digital scale: (GRAMS)

Distilled water in plastic cup. Zero-out scale

Specimen suspended in water with dental floss.

Compute the specific gravity by the method indicated in the web link.

Test specimen hardness: (Reference: https://en.wikipedia.org/wiki/Mohs_scale_of_mineral_hardness)

How do you use the hardness picks? Simply scratch a smooth surface of your unknown mineral with the picks of various indicated hardness. As an example, if a No. 5 pick scratches the mineral, but a No. 4 pick does not, then your mineral's hardness is 4.5. Then compare this against the included table of minerals listing hardness values to aid in identifying the unknown mineral.

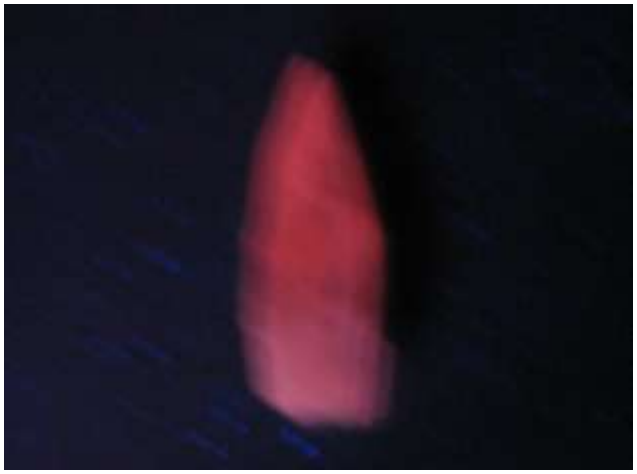
Hardness testing is best done under a microscope.
The hardness 3 point would not scratch this crystal, but the hardness 4 point did (microscope view).

Microscope view

Cleavage: Reference https://en.wikipedia.org/wiki/Cleavage_(crystal)
On the bottom, broken, surface of this crystal, excellent cleavage surfaces are observed in multiple planes/directions.

Solubility: Some minerals will dissolve in acid. Muriatic acid (dilute HCl) is frequently used by mineral collectors for mineral testing.
A grain from this crystal was placed on a glass slide under the microscope and a drop of muriatic acid was applied.
A vigorous effervescent fizz was observed. The grain totally dissolved.

Optical Properties: Some minerals fluoresce in ultra-violet light. Below is an image of this crystal in short wave UV.



What is your identification for this mineral ?
Why?
What chemical reaction happened when muriatic acid was applied? (Write a balanced equation for this reaction)