

GEOL 284 – Mineralogy

Introduction

The Professor:

Dr. Helen Lang

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The Syllabus

- Field Trips - Sept. 26, Dec. 5
 - Carnegie Museum of Natural History in Pittsburgh
 - You must go on at least one field trip!
- Lecture Schedule – see syllabus and Web-site
 - Readings
 - Test dates
- Lab Schedule

The Class: GEOL 284 Mineralogy

- Intended mostly for geology majors
- The first **major's** class for (most) geology majors
- What is Mineralogy?
 - The study of Minerals
- OK, then, what's a mineral?

A MINERAL IS:

- natural
- inorganic
- crystalline (has an orderly and repetitive atomic structure)
- solid
- with a well-defined chemical composition (varies within limits and can be represented by a chemical formula)

WHAT COMMON SUBSTANCES ARE NOT MINERALS BECAUSE OF THESE REQUIREMENTS?:

- natural
- inorganic
- crystalline
- solid
- with a well-defined chemical composition

WHY STUDY MINERALS?

- Minerals make up rocks
- Beauty, decoration and art of Minerals

- Why are some minerals cut as gems?
- What's special about diamond?

■ Usefulness of Minerals

- What useful minerals can you think of?
- Minerals in everyday life?
- Sources of metals & other valuable elements
- Industrial and Construction uses
- Household and food items
- Cosmetics
- Other uses?

What are metals used for?

■ Some minerals that are sources of metals

- gold, copper, silver
- galena (lead, PbS)
- sphalerite (zinc, ZnS)
- chalcopyrite (copper, CuFeS₂)
- molybdenite (molybdenum, MoS)
- Hematite (iron, Fe₂O₃)

Some Minerals used in Industry and Construction

- Gypsum in “dry wall”
- Diamond in drill bits and abrasives
- Phosphates for fertilizer
- Clays, many uses
- Asbestos, insulation, fire proofing, strength
- Paint pigments: white was PbO (what's wrong with lead?), now TiO₂ from ilmenite
 - What others can you think of?

Minerals in Food, Household Items & Cosmetics:

What properties are important?

- Abrasives in Cleansers & toothpaste - feldspars, calcite & dolomite
- Kitty Litter - clays and zeolites (absorb liquids)
- Sparkles in toothpaste, nail polish - micas
- Salt - halite; Salt substitute - sylvite
- Foot powder, baby powder - talc
- Face powders - clays
 - Others?

Uses of Minerals

- See Minerals in your Home “game” on the Mineralogical Society of America's Mineralogy for Kids page
- http://www.minsocam.org/MSA/K12/K_12.html
- Minerals in your World CD – Dr. Lang
 - Mineral Information Institute
 - USGS
 - American Coal Foundation