

Why study minerals?

- interesting and beautiful by themselves
- provide tools to interpret problems of rock origins, ore deposits, etc.
- industrially important
- their interactions with water dominate environmental concerns

Study of crystallography continues today:

- new structures and compositions for superconductors and composite alloys

Definition of “Mineral”

A mineral is a

- naturally occurring
- homogeneous
- inorganic
- solid
- with a definite chemical composition, and
- a highly ordered atomic arrangement

Mineral Classification Scheme

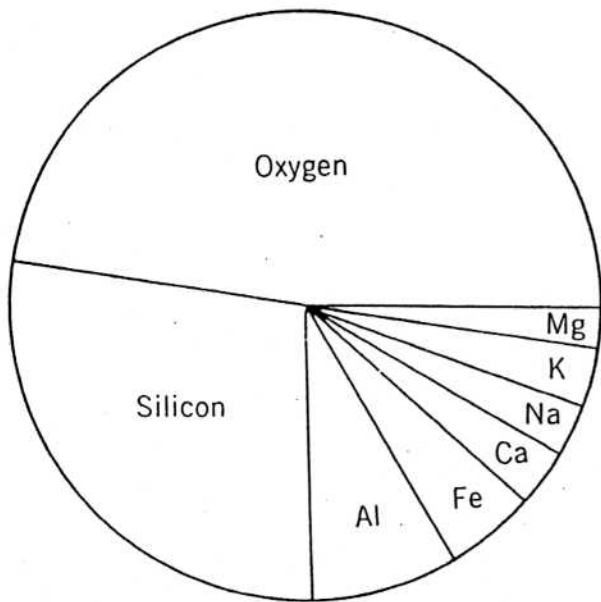
Based on dominant anion in the mineral (anion = negatively charged ion)

- share the same physiochemical characteristics
- tend to occur in the same sorts of geologic environments

Mainly focus on Oxygen as the anion grouped with some cation
(cation = positively charged ion)

in an anionic group (e.g., SiO_4^{4-} ; CO_3^{2-})

The number of oxygens that can coordinate with a cation to form an anionic group depends on the relative size of the cation



Weight percent

	Weight percent*	Volume percent
O	46.60	~ 94
Si	27.72	
Al	8.13	} ~ 6% in total
Fe	5.00	
Ca	3.63	
Na	2.83	
K	2.59	
Mg	2.09	
	<u>98.59</u>	