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12.001 Introduction to Geology
Spring 2008

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Halides

- Fluorite CaF_2
- Halite NaCl
- Sylvite KCl

halite x 2

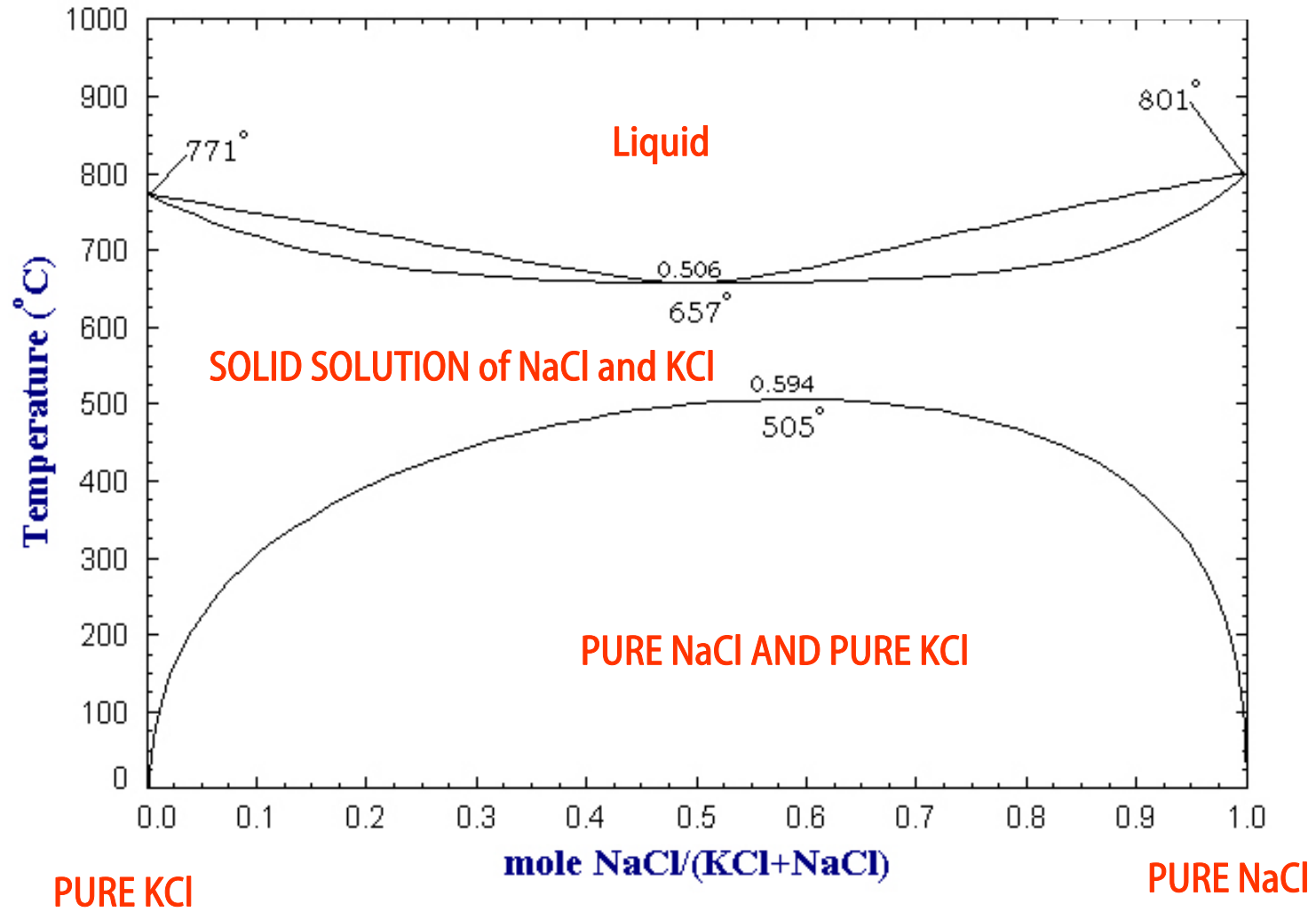
fluorite x 2

sylvite

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copyright restrictions.

KCl - NaCl

Data from FTSalt - FACT salt databases



Carbonates

- Second most abundant group in the Earth's crust
- Major component of limestone, marble, carbonatites
- Three major minerals:
Calcite: CaCO_3
Aragonite: CaCO_3
Dolomite: $(\text{Ca,Mg})\text{CO}_3$

calcite

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aragonite x 2

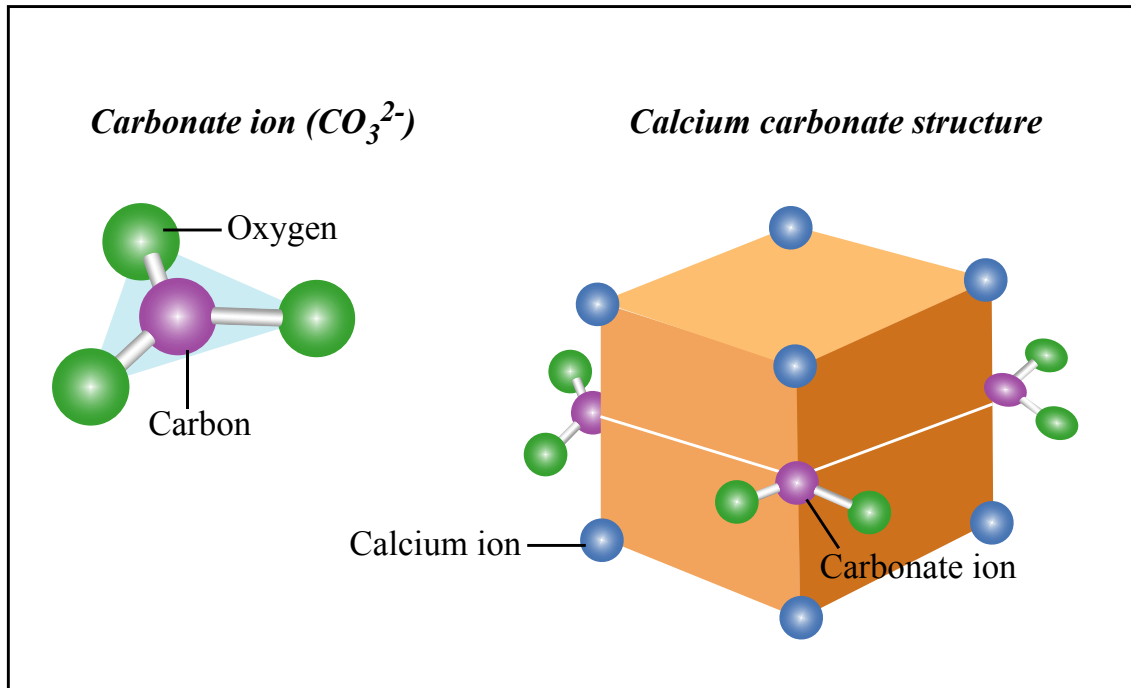
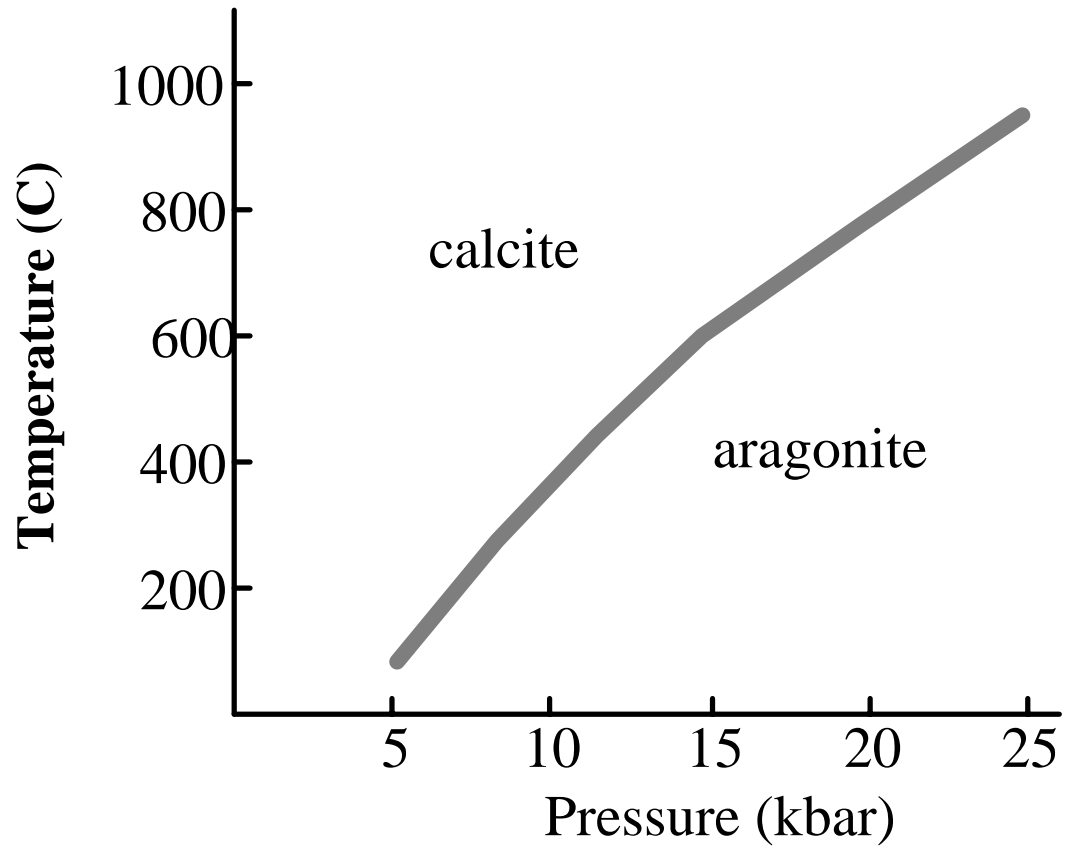


Fig. 3.12



Aragonite is the high-pressure polymorph of calcite, but it is also found in shells, hot springs, and cave deposits

Phosphates

Apatite: $\text{Ca}_5(\text{PO}_4)_3\text{S}$

apatite on calcite

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copyright restrictions.

70% of bone is made of “hydroxyapatite:” apatite, calcite, fluorite, calcium hydroxide;
90% of tooth enamel consists of this

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TEM image showing apatite nano-crystals in a well-preserved dinosaur bone. Huifang Xu, Madison

Sulfates

Gypsum $\text{CaSO}_4 \cdot \text{H}_2\text{O}$
(anhydrite: no H_2O)

Barite BaSO_4

barite

anhydrite

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gypsum, gypsum, growing in mud

Sulfides

Pyrite	FeS_2
Galena	PbS

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Oxides and hydroxides

Magnetite Fe_3O_4

Hematite Fe_2O_3

Corundum Al_2O_3

magnetite

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hematite x 2

corundum x 2