LECTURE TWENTY TWO: Putting it together

STUDY INFORMATION

- You will not be asked to derived equations or quote formulas with respect to this section of the work.
- You may need to provide sketches of diagrams that show the application of minerals
- You will be asked to comment about the application of optical mineralogy to geological problems.



Modelled evolution of Rb/Sr in the crust and the mantle. Clearly indicates differentiation of the crust and mantle at around 3.0Ga.

WHAT TO CONSIDER

- How was this diagram derived?
- What does it mean?
- What role do minerals play?
- What are the implications if we get it wrong?

THE RADIOGENIC DECAY EQUATION

• Use the radiogenic decay equation to derive the age and initial isotope ratio is different igneous rock systems

 ${\ensuremath{\bullet}}$ Use the radiogenic decay equation to derive the age of different metamorphic events

• Different radiogenic decay systems are used to date different things in different rocks because the elements are hosted in different minerals

• Rb/Sr in micas, K-feldspar, plagioclase, Sm/Nd in garnet and pyroxenes,

U-Th-Pb in zircon, monazite, titanite, allanite, Re/Os in sulphides

PROBLEMS WITH ACCESSORY MINERALS

ullet A large amount of dating particularly in older metamorphosed terraines, is done using U-Th-Pb on accessory phases

• How do we link the growth of accessory phases to metamorphic reactions that occur during metamorphism?







