

Review Sheet for Lecture #04: Precambrian Geology

Terms and Definitions: iron, nickel, ultramafic, mafic, intermediate, silicic, core, mantle, crust, partial melting, komatiite, proto-plates, drip-tectonics, flux melting, island arcs, microcontinents, subduction, microcontinental accretion, Archean, Proterozoic, orogen, Phanerozoic, craton, shield, platform, granulites, greenstone belts, back arc basin, supercontinent, Rodinia, Grenville Orogeny

Persons: none

Dates:

By what time had 90% of the Earth's continental crust formed: Neoproterozoic

Oldest Igneous Rocks on Earth: 3.5 billion years

Oldest Metamorphic Rocks on Earth: 4.32 billion years

Oldest Mineral Grains on Earth: 4.40 billion years

Age of Formation of Rodinia: 1200-900 million years ago

Places:

Pilbara Province, Australia

Nuvvuagittuq Greenstone Belt

Review Questions:

Explain how the processes of partial melting, fractional recrystallization, and magma assimilation and how they can lead to a great range of magma/lava compositions.

Explain how the Earth's early crust evolved from ultramafic to mafic composition as a result of the Earth's cooling.

How are TTGs evidence of early plate tectonics?

How does partial melting and fractional crystallization lead to the formation of continental crust in subduction zone volcanic arcs?

Why are so few Archean rocks known today?

Explain the tectonic settings in which greenstone belts were believed to have formed

Why do we find evidence of the Grenville Orogeny on almost every continent on Earth?