

Chapter 6 Rocks

SECTION 1 ROCKS AND THE ROCK CYCLE

Review

1. According to Bowen's reaction series, the composition of the minerals that form from magma can change either slowly or suddenly.
2. Possible answer: The igneous rock could be buried and put under a lot of heat and pressure. The heat and pressure could change the composition of the rock without melting it, turning it into a metamorphic rock. The igneous rock could also be broken down into sediment, which could be laid down, buried, and pressed together to form sedimentary rock. That sedimentary rock could then be put under high heat and pressure, which would change it into metamorphic rock.
3. Igneous rock forms when melted rock cools and hardens. Metamorphic rock forms when heat and pressure change the chemical composition of a rock without melting the rock.
4. Granite is probably more stable. The minerals in a rock and the structure of the rock affect how stable the rock is. Minerals that form late in Bowen's reaction series tend to be more stable than those that form earlier. Quartz, feldspar, and mica form later in the series than olivine, pyroxene, and amphibole. In addition, the cracks in the basalt will make it weaker and more likely to break down.

SECTION 2 IGNEOUS ROCK

Review

1. second column, from top to bottom: composition; texture third column, from top to bottom: felsic; intermediate; mafic; fine grained; coarse grained
2. The rock that contains fluids and is under low pressure will probably melt at a lower temperature. Both lowering the pressure on a rock and adding fluids to it lower melting temperature.
3. Intrusive igneous rocks form when magma cools underground. They are generally coarse grained. Extrusive igneous rocks form when lava cools on Earth's surface. They are generally fine grained.
4. A laccolith forms when magma pushes a rock layer up into a dome. Therefore, the ground above a laccolith might have a domeshaped hill on it.

SECTION 3 SEDIMENTARY ROCK

Review

1. The scientist is studying a chemical sedimentary rock. These rocks form when water evaporates, not through compaction and cementation.
2. stratification, cross-beds, graded beds, ripple marks, mud cracks, fossils, concretions
3. The particles are all about the same size, so they are well sorted. Well-sorted sediment can be laid down by water that slows gradually, so the sediment in the rock may have been deposited by that type of water. In general, sediment particles become smoother and rounder as they are transported, so the sediment was probably transported far from its source.
4. An organic sedimentary rock is more likely to contain fossils than mud cracks. Fossils are signs that living things once existed. Organic sedimentary rocks form from the remains of living things, so they are likely to contain fossils. Mud cracks form when mud dries and shrinks. Organic sedimentary rocks generally do not form from mud, so mud cracks are unlikely to appear.

SECTION 4 METAMORPHIC ROCK

Review

1. regional metamorphism only: caused by heat and pressure generated by the movements of tectonic plates
regional metamorphism and contact metamorphism: can cause changes to chemical composition of rock
contact metamorphism only: caused by heat from magma that touches rock underground
2. The minerals in the rock can react to form new minerals. The mineral crystals can change size or shape.
Molecules of different minerals can move through the rock to form bands of different kinds of minerals.
3. The metamorphic rock in the Himalaya Mountains probably occurs in wide regions. Regional metamorphism occurs where tectonic plates collide. It affects rock over a very large area.