

Metamorphic Rocks: Chapter4, Lesson 4, pages 132 – 136.

Guided Study Notes

Rocks are affected by changes in temperature and pressure and may behave like **bendable plastic**.

Though they may not melt completely, rocks bend and fold.

Metamorphism is any process that affects the structures or composition of a rock in a solid state as a result of changes in temperature, pressure, or the addition of chemical fluids. When exposed to such conditions, metamorphic rocks can appear as bent, twisted, or wrinkled layers of rocks. (p. 133)

*Most metamorphic rocks form **deep within** Earth's crust. They form under conditions of high temperature and pressure. Unlike igneous rocks, they **do not** crystallize from magma. Also, unlike sedimentary rocks, metamorphic rocks **do not** result from erosion and deposition.

Plastic deformation – is a shape-changing (bending and folding) process that rocks go through when exposed to **extreme increases** in temperature and pressure. A rock's **texture, composition, and structure** are also affected during this process. Plastic deformation occurs during **uplift** (the collision of tectonic plates). (p. 134)

Changes in **temperature, pressure, or the addition of chemical fluids** can result in the formation of new minerals in a metamorphic rock. There are **two classifications** of metamorphic rocks based on **texture**:

Foliated Rocks – are rocks that contain **parallel layers of flat and elongated minerals**. Layering results from an **uneven distribution of pressure** during metamorphism. *(see page 135 in textbook)

Nonfoliated Rocks – are rocks that contain **mineral grains with a random, interlocking texture**. The rock's **crystalline texture is usually uniform in color**, and its **crystals are blocky** and **nearly equal in size**. *(see page 136 in textbook)

Contact Metamorphism – occurs when **magma** comes in contact with existing rock, and its **thermal energy and gases interact** with the surrounding rock, forming new metamorphic rock. When this process takes place, there can be changes in rocks, an increase in crystal size, or the formation of new minerals. (p. 136)

Regional Metamorphism – is the formation of metamorphic rock bodies that are hundreds of square kilometers in size. (Think – mountain “building”). This process consists of changes in temperature, pressure, and the presence of chemical fluids that act upon large areas of rock. (p. 136)