**PROJECT 2**

**Task to be done:**

1. Briefly describe rock cycle defining each rock type and the processes leading to their formation.
2. Define texture and composition of igneous rocks.
3. Define the following rock textures:
   1. Aphanitic
   2. Phaneritic
   3. Porphyritic
   4. Vesicular
   5. Glassy
   6. Pegmatitic
4. List 9 igneous rock forming minerals and their formulae
5. Define:
   1. Ultramafic
   2. Mafic
   3. Intermediate
   4. Felsic
6. Classify the following rocks as either Extrusive or Intrusive and state whether they are Ultramafic, Mafic, intermediate or felsic:
   1. Peridotite
   2. Basalt
   3. Gabbro
   4. Andesite
   5. Diorite
7. List and briefly define three types of volcanoes

**Response to the project**

1. **Rock Cycle**

Rock cycle is a sequence of processes in which rocks change from one form to another gradually by various geological processes. These processes involves molten rocks in the earth’s crust moving to the surface of the earth, solidifying and going back into the earth’s crust.

Molten magma is ejected from the interior of the earth to the surface where it cools, solidifies and crystallise to form igneous rocks. Weathering then breaks down these rocks into fragments which are carried away by erosion into lakes and oceans where they are deposited in layers and gets lithified into sedimentary rocks.

Both igneous and sedimentary rocks gets buried deep in the interior of the earth where extreme heat and pressure changes them into metamorphic rocks rather than melting. Metamorphic rocks are then buried further into the crust where they melt to form magma and the cycle begins.

**2. Texture and Composition of Igneous rocks**

* **Texture**- refers to the size and arrangement of mineral particles that make up a rock.
* **Composition** – refers to the constituents of a rock in terms of minerals within a rock and overall chemical makeup of the rock.

**Types of Igneous Rock Textures**

1. **Aphanitic**:- Uniformly fine-grained texture in which the individual crystals are too small to be seen easily without magnification.
2. **Phaneritic**:- Uniformly coarse-grained texture in which all the individual crystals are easily viscible without magnification.
3. **Porphyritic**:-Igneous-rock texture in which large crystals are set in a fine-grained or glassy groundmass.
4. **Vesicular**:-Igneous rocks with holes resulting from air bubbles in lava.
5. **Glassy**:-Non-crystallined texture of rocks formed by rapid cooling of erupted magma into the earth’s atmosphere.
6. **Pegmatitic**:-coarse-grained texture in which most of the crystals are larger than one centimetre.

4.**Common igneous rock forming minerals**

(a) .Quartz- SO2

(b) .Olivine-(Mg, Fe) 2SiO4

(c) .Amphibole-Mg14[(OH)4Si16O44 ]

(d) .Pyroxene-Mg2(Si2O16)

(e) .Biotite-K(Mg, Fe) 3AlSi3O10(F,OH)2

(f) .Muscovite- KAl2(Si3Al) 10(OH)2

(g) .plagioclase-NaAlSi3O8--CaAl2Si2O

(h) .Mica- [KAl2(AlSi3O10)(F, OH)2 ]

5. **Definition of:**

a)***Ultramafic***:- An igneous rock with extremely low silica composition, being made of almost olivine and pyroxene.

b) ***Mafic***:- A kind of igneous rock that is relatively high in magnesium and iron content

c) ***Intermediate***:- igneous rock with medium silica composition, equally rich in felsic and magic mineral composition.

d)***Felsic***:-silicate rocks enriched with lighter elements such as sodium.

6. **Classification of igneous rocks**

|  |  |  |
| --- | --- | --- |
| Igneous Rock | Type of igneous rock | Class |
| Peridotite | Intrusive | Ultramafic |
| Basalt | Extrusive | Aphanitic |
| Gabbro | Intrusive | Mafic |
| Andesite | Extrusive | Felsic |
| Diorite | Intrusive | Mafic |
| Rhyolite | Extrusive | Felsic |
| Granite | Intrusive | Felsic |

7. **Types of volcanoes**

(a) ***Composite*** ***volcano:***-steep-sided cone shaped volcano built from several layers of lava, pumice ,ash forming high peaks due to very viscous lava.

(b) ***Shielded volcano:***- a broad rounded volcano built up successive outpouring of very fluid lava.

(c)***Cinder cone volcano:***-a volcano built from particles and blobs of congealed lava ejected from a single vent forming a crater at the summit.