

Identification of Rocks and Minerals (UG Hons. 2nd year)

by

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COLLEGE

TALC



- **1. COLOUR** : White, light to dark green, blue, brown white.
- **2. CLEAVAGE** : Perfect on basal cleavage.
- **3. FRACTURE** : Irregular.
- **4. HARDNESS** : 1 (on Moho scale).
- **5. LUSTRE** : Waxlike or pearly.
- **6. STREAK** : White to pearl green.
- **7. SPECIFIC GRAVITY** : 2.58 – 2.83 g/cm³.

GYPSUM



- **1. COLOUR:** Colourless to white; may be yellow, blue, pink, brown.
- **2. CLEAVAGE:** Distinct.
- **3. FRACTURE:** Conchoidal.
- **4. HARDNESS:** 1.5 – 2 (on Moho scale).
- **5. LUSTRE:** Vitreous to silky; pearly, or waxy.
- **6. STREAK:** White.
- **7. SPECIFIC GRAVITY:** 2.31 – 2.33 g/cm³.

CALCITE



- **1. COLOUR:** Colourless or white, gray, yellow, green.
- **2. CLEAVAGE :** Perfectly 3-dimensional.
- **3. FRACTURE:** Conchoidal.
- **4. HARDNESS:** 3 (on Moho scale)
- **5. LUSTRE:** Vitreous to pearly.
- **6. STREAK:** White.
- **7. SPECIFIC GRAVITY:** 2.71 g/cm³.

MICA



- **1.COLOUR:** Colorless or lightly tinted to dark brown, dark green or black.
- **2. CLEVAGE :** One plane of cleavage
- **3. FRACTURE:** Does not fracture
- **4. HARDNESS:** 2.5-3. Micas can be scratched with a knife blade .
- **5. LUSTRE:** Pearly, silky or metallic.
- **6. STREAK:** White
- **7. SPECIFIC GRAVITY :**2.76 for muscovite to 3.2 g/cm³ for biotite.

FELDSPAR



- **1. COLOUR:** Pink, white, gray, brown.
- **2. CLEAVAGE :** Two or three
- **3. FRACTURE:** Conchoidal or brittle.
- **4. HARDNESS:** 6 – 6.5 (on Moho scale).
- **5. LUSTRE:** Glassy to pearly
- **6. STREAK:** White
- **7. SPECIFIC GRAVITY:** 2.55 – 2.76 g/cm³.

QUARTZ



- **1. COLOUR:** Colourless through various colours to black.
- **2. CLEAVAGE:** Indistinct.
- **3. FRACTURE:** Conchoidal.
- **4. HARDNESS:** 7 (on Moho scale).
- **5. LUSTRE:** vitreous – waxy to dull when massive.
- **6. STREAK:** White.
- **7. SPECIFIC GRAVITY:** 2.59 – 2.65 g/cm³.

CHALCOPYRITE



- **1.COLOUR:** Brass yellow.
- **2. CLEAVAGE:** Poor.
- **3. FRACTURE:** Irregular to uneven.
- **4. HARDNESS:** 3.5 (on Moho scale)
- **5. LUSTRE:** Metallic.
- **6. STREAK:** Greenish black.
- **7. SPECIFIC GRAVITY:** 4.1 – 4.3 g/cm³.

HEMATITE



- **1. COLOUR:** Metallic gray, dull to bright red.
- **2. CLEVAGE:** None.
- **3. FRACTURE:** Uneven to sub-conchoidal.
- **4. HARDNESS:** 5.5 – 6.5 (on Moho scale)
- **5. LUSTRE:** Metallic to splendid.
- **6. STREAK:** Bright red to dark red.
- **7. SPECIFIC GRAVITY:** 5.26.

MAGNETITE



- **1. COLOUR:** Black, gray with brownish tint in reflected sun.
- **2. CLEAVAGE:** Indistinct.
- **3. FRACTURE:** Uneven.
- **4. HARDNESS:** 5.5 – 6.5 (on Moho scale)
- **5. LUSTRE:** Metallic.
- **6. STREAK:** Black.
- **7. SPECIFIC GRAVITY:** 5.17 – 5.18 g/cm³.

BAUXITE



- 1. **COLOUR:** White, gray, sometimes stained yellow, orange red, pink, brown or yellow.
- 2. **CLEAVAGE:** Poor.
- 3. **FRACTURE:** Conchoidal.
- 4. **HARDNESS:** 1 – 3 (Moho scale)
- 5. **LUSTRE:** Dull, earthy.
- 6. **STREAK:** Usually white but iron stain can discolour.
- 7. **SPECIFIC GRAVITY:** 2.0 – 2.5 g/cm³.

GALENA



- **1. COLOUR:** Lead gray and silvery.
- **2. CLEAVAGE:** Cubic perfect.
- **3. FRACTURE:** Subconchoidal.
- **4. HARDNESS:** 2.5 – 2.75 (on Moho scale)
- **5. LUSTRE:** Metallic.
- **6. STREAK:** Lead gray.
- **7. SPECIFIC GRAVITY:** 7.2 – 7.6 g/cm³.

GRANITE



- **TYPE:** Acidic, plutonic igneous rock.
- **COLOUR:** Variable, pink to gray but typically light-coloured.
- **OCCURRENCE:** Massive, hard and tough.
- **TEXTURE:** Coarse-grained.
- **COMPOSITION:** Quartz, feldspar, mica.
- **SPECIFIC GRAVITY:** 2.65 and 2.75 g/cm³.

BASALT



- **TYPE** : Mafic, extrusive or volcanic
- igneous rock.
- **COLOUR** : Dark grey to black.
- **OCCURRENCE** : Very compact with conchoidal fractures.
- **TEXTURE** : Aphanitic (can be porphyritic)
- **COMPOSITION** : Pyroxene ([augite](#)), [plagioclase](#)
- feldspar and [olivine](#).
- **SPECIFIC GRAVITY** : 2.80 to 3.1 gm/ cm³.
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DOLERITE



- **TYPE:** Hypabyssal mafic igneous rock.
- **COLOUR:** Black.
- **OCCURRENCE:** Massive, but polygonal joints occur in the thicker intrusions
- **TEXTURE:** Medium grains.
- **COMPOSITION:** Porphyritic, containing phenocrysts of plagioclase feldspar, olivine and even quartz.
- **SPECIFIC GRAVITY:** 2.64 - 3.12 gm/cm³.

SANDSTONE



- **TYPE :** Clastic sedimentary rock.
- **COLOUR:** Variable through grey, yellow, red to white.
- **TEXTURE:** Grain size varies from 0.06 – 2 mm and clasts are visible to the naked eye.
- **COMPOSITION:** Quartz and feldspar with clay minerals to calcite, silica or iron oxides.
- **HARDNESS:** Variable, soft to hard.
- **TOUCH:** Gritty to touch (like sandpaper).

SHALE



- **TYPE:** Clastic sedimentary rock of argillaceous type.
- **COLOUR:** Variable, black, brown, green and red.
- **TEXTURE:** Fine grained non-clastic.
- **COMPOSITION:** Mixture of clay minerals such as, illite, montmorillonite, kaolinite and chlorite)
- **HARDNESS:** Low hardness (can be scratched by fingernails)
- **TOUCH:** Rough to touch.
- **SPECIFIC GRAVITY:** Low specific gravity.

LIMESTONE



- **TYPE:** Non-clastic sedimentary rock.
- **COLOUR:** Light coloured, although grey through yellow colour may be seen.
- **TEXTURE:** Grain size variable.
- **COMPOSITION:** Calcium carbonate.
- **HARDNESS:** Compact but low hardness.
- **TOUCH:** Smooth to rough.
- **GRAVITY:** 2.5 – 2.8 gm/cm³.
- **REACTION:** Reacts with dilute hydrochloric acid.

CONGLOMERATE



- **TYPE:** Clastic sedimentary rock of rudaceous type.
- **COLOUR:** Variable.
- **TEXTURE:** Coarse-grained, grain size is >2 mm with pebbles, gravels.
- **COMPOSITION:** Grains of quartz, feldspar and rock fragments
- **HARDNESS:** Moderate compactness.
- **TOUCH:** Clasts are smooth to touch.
- **SPECIFIC GRAVITY:** Moderate to high specific gravity.

SLATE



- **TYPE :** Low grade metamorphic rock.
- **COLOUR:** Black, shades of blue, green, red, brown and buff.
- **CLEAVAGE:** Fine foliation called slaty cleavage.
- **COMPOSITION:** Mica minerals (biotite, chlorite, muscovite).
- **HARDNESS:** Low hardness, moderate compactness.
- **ODOUR:** Muddy
- **TOUCH:** Smooth to touch
- **SPECIFIC GRAVITY:** Low specific gravity.

PHYLLITE



- **TYPE:** Metamorphic rock formed through regional metamorphism from slate.
- **COLOUR:** Black to gray or light greenish gray.
- **CLEAVAGE:** Foliated and commonly crinkled or wavy in appearance.
- **COMPOSITION:** Graphite, sericite or chlorite, white mica.
- **LUSTRE:** Silky, sometimes golden sheen to the surfaces of cleavage, called "phyllitic luster".
- **HARDNESS:** Low hardness, moderate compactness.
- **TOUCH:** Smooth to touch

SCHISTS



- **TYPE:** Medium grade metamorphic rock formed through regional metamorphism from mudstone, shale.
- **COLOUR:** Variable - alternating lighter and darker bands, often shiny.
- **CLEAVAGE:** Foliation is coarser and more distinct than that of slate.
- **COMPOSITION:** Biotite, chlorite, quartz, muscovite, plagioclase, garnet.
- **TEXTURE:** Fine to medium grained and often crystals can be seen with the naked eye.
- **HARDNESS:** Low hardness, low compactness.
- **TOUCH:** Smooth to touch.
- **SPECIFIC GRAVITY:** Medium specific gravity

MARBLE



- **TYPE:** Metamorphic rock formed through regional metamorphism from limestone.
- **COLOUR:** Variable, generally white but also pink, black and others.
- **CLEAVAGE:** Sometimes show crude foliation.
- **COMPOSITION:** Calcite.
- **TEXTURE:** Granular texture, medium grained with interlocking calcite crystals.
- **HARDNESS:** Low hardness, high compactness and can be scratched by a metal blade.
- **TOUCH:** Gritty to touch.
- **SPECIFIC GRAVITY:** Medium specific gravity.
- **REACTION:** Effervesce with dilute HCl acid.

QUARTZITE



- **TYPE:** Metamorphic rock formed through regional metamorphism from sandstone or chert.
- **COLOUR:** Variable, generally white.
- **LUSTRE:** Sugary appearance and glassy lustre.
- **COMPOSITION:** Greater than 90% quartz.
- **TEXTURE:** Granular texture, medium grained with interlocking quartz crystals.
- **HARDNESS:** Very hard, 7 on Moho scale.
- **TOUCH:** Gritty to touch.
- **SPECIFIC GRAVITY:** Low to medium.

GNEISS



- **TYPE:** High grade metamorphic rock formed by the metamorphosis of granite or sedimentary rock.
- **COLOUR:** Highly variable, generally alternating lighter and darker sub-parallel discontinuous bands.
- **STUCTURE:** Foliated structure or foliation.
- **COMPOSITION:** Feldspar, quartz, biotite, pyroxene (augite), amphibole (hornblende) and garnet.
- **TEXTURE:** Medium to coarse grains and the crystals can be seen with the naked eye.
- **HARDNESS:** Very hard.
- **TOUCH:** Rough to touch.
- **SPECIFIC GRAVITY:** Medium.

THANK YOU