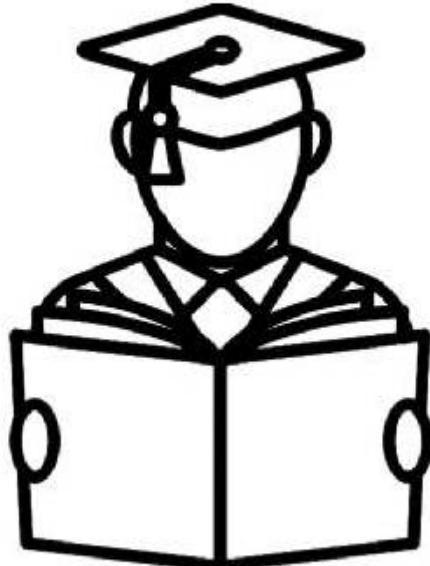


चौधरी PHOTOSTAT

"I don't love studying. I hate studying. I like learning. Learning is beautiful."



"An investment in knowledge pays the best interest."

Hi, My Name is

Earth Science
for CSIR NET
Career Evenues

Convergent Boundaries

5/1/17

- ▷ Layered texture → Glomeroporphyritic texture clusters of phenocrysts
- ▷ Metacarbonate
- ▷ Porphyritic deposit

Petrology of Igneous rocks on the boundary

▷ Basalt - have phenocrysts of olivine,辉石, plagioclase

Andesites -辉石, plagioclase, Hypersthene, Hornblende.

Olivine, Zircon, Anorthite groundmass

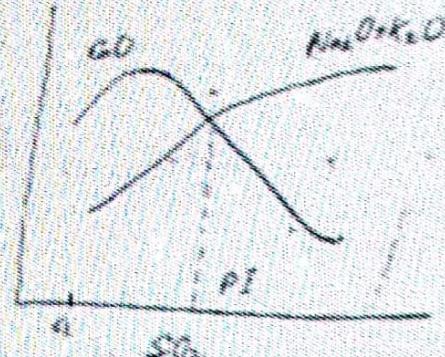
Andesites in convergent boundaries have a pre dominent clinopyroxene present. They display oscillatory zoning

Rhyolite - Obsidian / Granophyre

Penck's Index

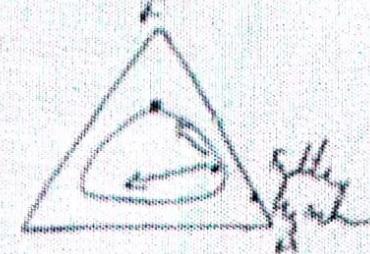
(Alkaline-Lime Index)

SiO_2	Penck's Index
< 51	Nepheline
51-56	Alkaline-Calcic
56-61	Calcic-Alkaline
> 61	Calcic



- ▷ Hot subduction related igneous rocks fall into Calcic-Alkaline group
- ▷ Based on the AFM diagram the ratio of MgO remains constant

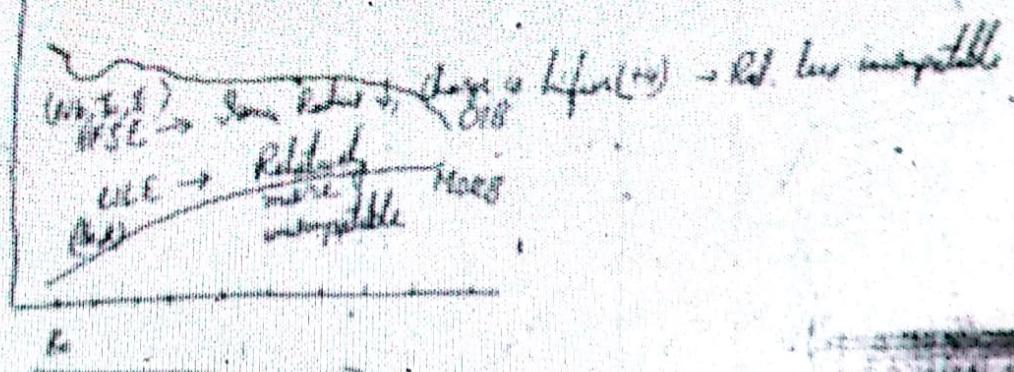
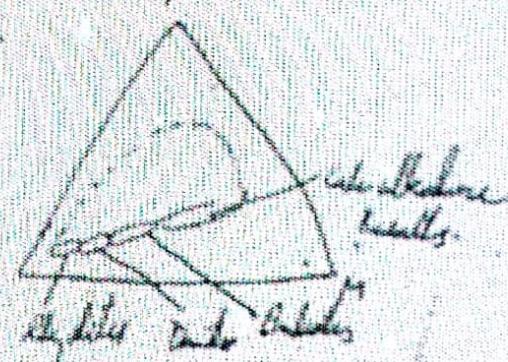
$$\frac{\text{MgO}}{\text{FeO} + \text{FeO}} = \frac{\text{MgO}}{\text{MgO} + \text{FeO}}$$

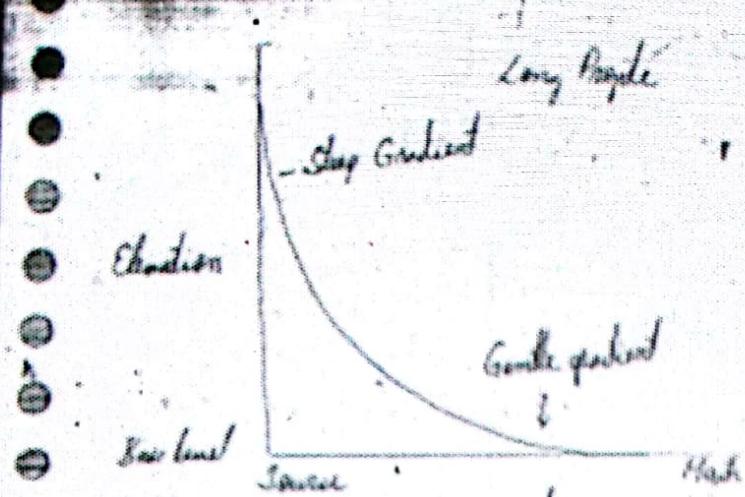


Q. The domal andges despite that basal contain much more H.
(H.D.-15%) in comparison to Riddles (H.O.-9%). This is
because basal contains very little lime

- a) Gabbro is a domed rock
- b) high proportion of pyroxene
- c) No quartz

- Calc-alkal basal are sub-alkaline b) they differ poor
- Calc-alkaline basal 17-20% are known as High Alkaline Basalts
- Calc-alkaline basal can be explained by early removal of mineral overgrowth with high Fe/Mg ratio
- Another difference betw gabbros and calc-alkaline rocks is the presence of feldspar minerals like hornblende



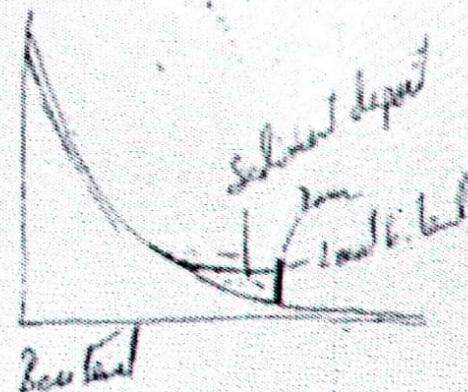


Three Stages of running water

① Youthful Stage - This stage is marked by V-shape valley, no flood plains or narrow flood plains.
Waterfalls and rapids may exist.

② Mature Stage - Streams are wide, V-shaped valley but deep, flat and broad inter-stream areas.

③ Old Stage - Smaller streams, gentle gradient and wide, meandering areas or wet flood plains, natural levees, sand bars and oxbow lakes.



Ques

Base level - Land below which stream can never drop its level
(and) sea level - River stream meet a resistance body, adjusted downwards but still further erosion

Load

Rock particles and dissolved ions constitute a load. Amount of load depends on topography, lithology & slope, climate, vegetation.

Suspended - Load which is carried along the stream, size depends on density and velocity of the stream.

Bed load - Coarse and dense particles that are on the bed of the river.

Dissolved ions - Chemically dissolved salts present in the form of ions.

Change downstream

- As one moves along the long profile and comes down stream discharge increases, width, depth and average densities inc., the sediment size of the particle dec because of abrasion, attrition. Coagulation might change if big bedrocks are encounter.

Floods

- When discharge becomes too high with accommodation in the original stream. The area that becomes flooded is called flood plain. Dam failure, frozen areas, heavy rainfall.

Pitfalls



Kinetics Properties of Rocks

①

Porosity

Porosity

Morphological
Classification

According to time &
porosities

long
duration

Ephemeral
Porosity

Syngenic
Porosity

Types
Intergranular

Open

Intergranular

Interstitial

Primary

Closure
Porosity

C.I.-L.-sat.
Desat.

→ Closed porosity

Intergranular

Interstitial

Consolidation
closure (latent)

Secondary

porosity

- Vuggy
- Malleic

- Fracture

Vuggy
Malleic

Fracture

Dehydration/Fraction

Porosity → Voids & Voids

Void vol. & void

Intergranular porosity - found in all sediments. Porous, resulting either due to
grain or other particles

Interstitial porosity - Porous, either individual grains

Intergranular - Porous occurring in between crystal pores of sediment rock

Generally small the maximum intergranular pores

Fracture porosity : All pores where there is a primary gap or a rock framework
is large than the grain size of the grains

Vuggy porosity - large void space occurring due to solution activity

Malleic porosity - Porous, resulting due to sediment replacement of grains of
matrix

Dehydration porosity - Resulting due to reduction between grain size or
between activity of dehydration. The type of porosity depends
on the porosity capacity, and permeability

1.8 hours (10,000 km)

Box (?)

Current
Address

Satellite Receiver
(Point, and Transmitter)

Central Receiver
(Rx, Tx)

0 10 10 100 1000

$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$

Probability

$$\geq D \cdot \frac{1}{\mu L} \cdot (P_1 - P_2) A$$

Probability word come or not
 each speech, probability along
 the billing plane a greater than
 the probability



$$K >> L$$

Effect probability, the ability of a user to conduct a call in presence of other users.

Relative probability Effect prob of a user find of path selection limited by
 of all other selection

Priority, K and Selection

user type - Priority and Selection
 Grade by maximum quality

Priority

Selection is the degree to which a particular

Paleontology

2017

Key - Plate tectonics Paleogeology, Stratigraphy, Plate tectonics

Key

Gisology
Biology

Key

- ① Paleogeography
- ② Plate tectonics
- ③ Stratigraphy
- ④ Plate tectonics

① Evolution

② Ecology

③ Paleo Biology / Biogeography

Type.

Domain

Kingdom

Phylum

Class

Order

Family

Genus

Species

Taxonomy (Classification)

Earliest

→ Period by which living organism become preserved as geological material

(Geological)

→ Directly older

① Multiple child elements

② Very specific characteristics

③ Abundant

④ Long geological duration

⑤ Living in area where elements are deposited

Mold & Pseudomorph

Mold

- They are impressions of organisms, hard, shape left in the sediments by organisms hard parts which were dissolved or removed from the enclosing rock.

Mold is an impression of the hollow interior of the exterior surface of an organism. They are open to either internal holes or external holes. Also is a cavity of an organism created when a mold becomes infilled by sediment.

Pseudomorph

- It's pores which contain veins as soon may be filled by calcite or sulphide that convert the still organic structure and remain as pure larger crystals. Normally the pseudomorph is angular and on the irregular, change to calcite. Calcite may well in a more stable form and have no visible effect on the outer appearance of a fossil.

Cementation

- It is a process that involves the addition of mineral material originally from outside.
- It's a common for broken structures such as shells, which form various sized pores or cavities to be surrounded by minerals such as silica & calcite that got from groundwater. Thereby the pores.

Replacement

- It's a complex physical process that results in gradual replacement by cements addition of hard type of minerals, replacing an groundwater. The deposit of such rock by silica such as quartzite is a good example of this, and this also is much correctly called cherts.

Alluvium - as mm upwards in size

Ooids, plaoids, oncoids, pellets, sand or pre-existing carbonate fragments.

Typically embedded in a matrix of mudstone (lime mud) or sandy calcite.

$$\text{Var ratio} e = \frac{e}{100} = 0.25$$

$$\text{variance } \sigma^2 = \frac{e}{n_e} = \frac{0.25}{110.25} = \frac{0.25}{1.35} = \frac{0.25}{1.35} = 0.2$$

$$\sigma(\bar{v}) = 0.2 \times 100 = 20$$

Stokes Theorem - states that the surface integral of the curl of a vector over any surface bounded by a closed path is equal to the line integral of a particular vector function around the path.

$$\int \vec{v} \cdot \vec{F} dS = \oint \vec{F} \cdot \vec{dr}$$

Where, \vec{F} = Vector function

dS = small surface area

dr = small line path

Engineering Properties of Rocks and Soil

②

Soil

- It is the ultimate product of weathering.

Soil horizons

- O horizon : Thin (1-2 cm) organic matter, lower part due to humus.

A horizon : Groundwater percolates downward and dissolves solubles, contains more organic matter than B and C.

Dark humus layer at the top

E horizon : Transition between A and B

O+A = Top soil

O+A = E = Zone of leaching

B horizon : Sub soil, zone of accumulation of mineral leach down from A

Red, brown or grey in colour.

Very little organic material

C horizon : Mixture of soil and bedrock.

Factors controlling soil formation

① Organic activity

② Topography

③ Climate

④ Drainage

⑤ Parent material