Lab manual

Visual Classification

Aim: To classify the soil through a series of quick tests

Procedure:

1. Dry Tests (colour, odour, texture & grain properties)
2. Wet Tests (volume change & dilatancy)
3. Microscopic Investigation

Data Sheet:

	Dry Tests				Wet Tests		
Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
	1	2	3	4	5	6	7
A							
B							

1. Dry Tests

Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
	1	2	3	4	5	6	7
A							

1. Colour: Brown, Reddish Brown, Yellow, Cream, Black, etc.

Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
	1	2	3	4	5	6	7
A							

2. Odour: odourless, mild chemical odour, pungent odour, etc.

Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
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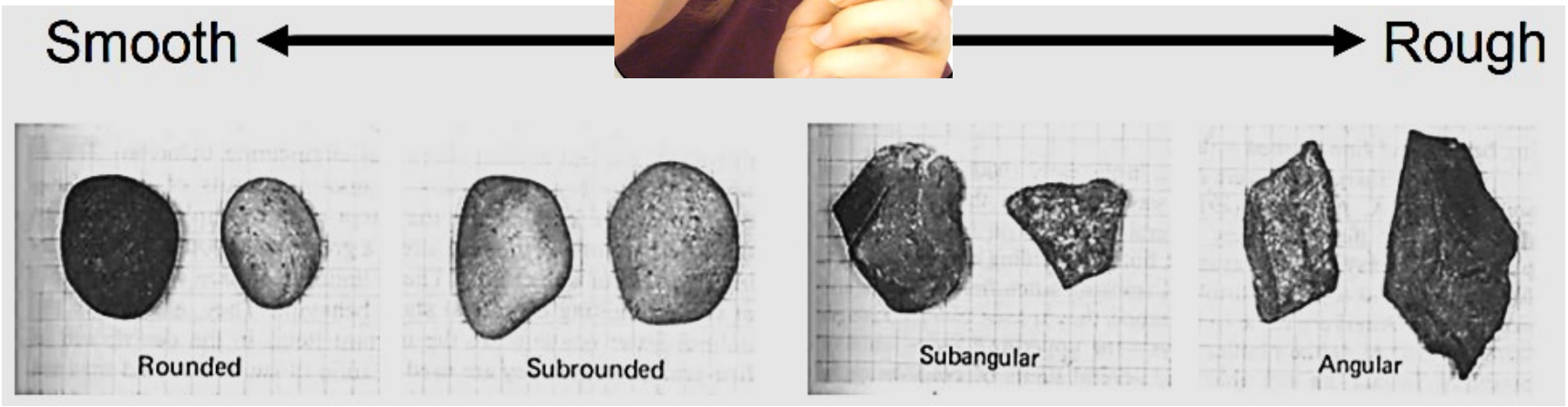
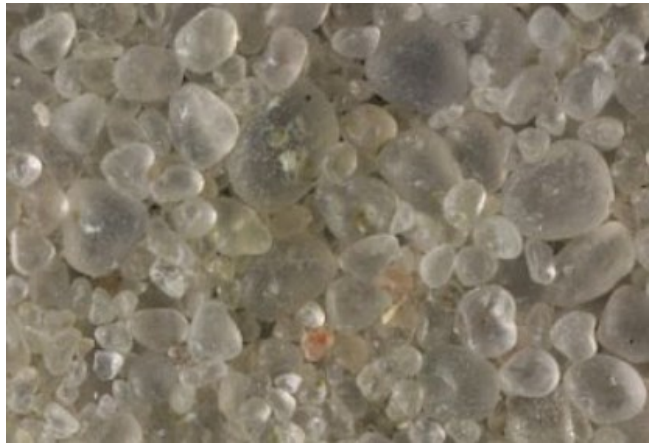
A							

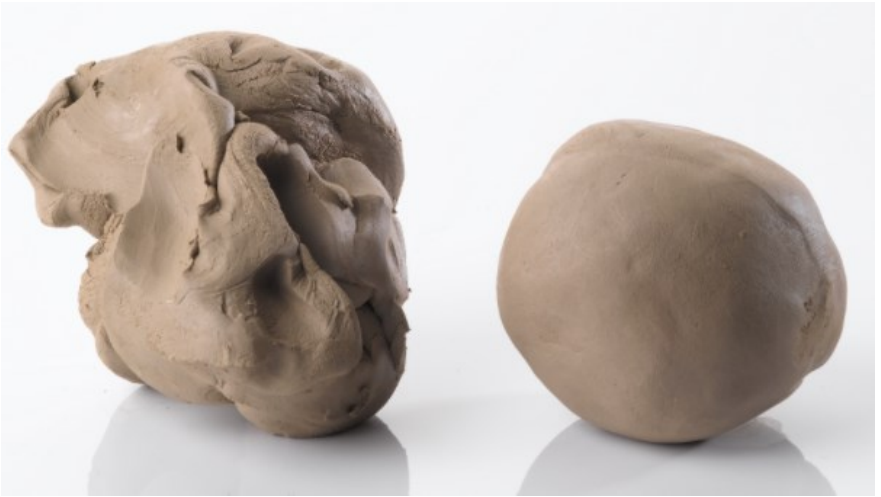
3. Texture: **Shape** (angular, subangular, rounded, subrounded, flaky/platy), **Surface Texture** (rough, smooth, gritty), **Appearance** (glossy, dull)





Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
	1	2	3	4	5	6	7
A							

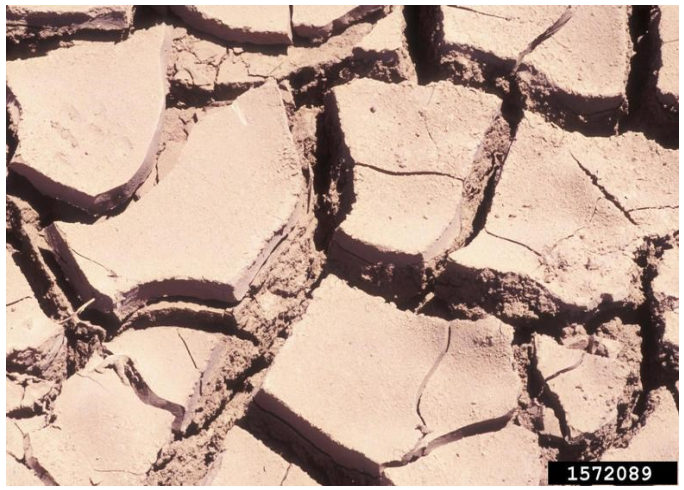
4. Grain Properties: Coarse & Fine

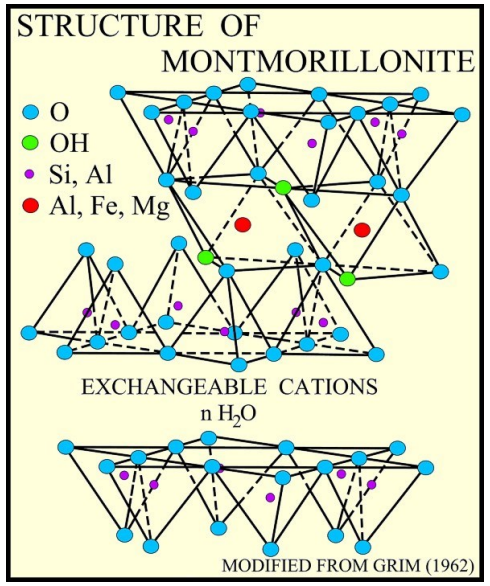


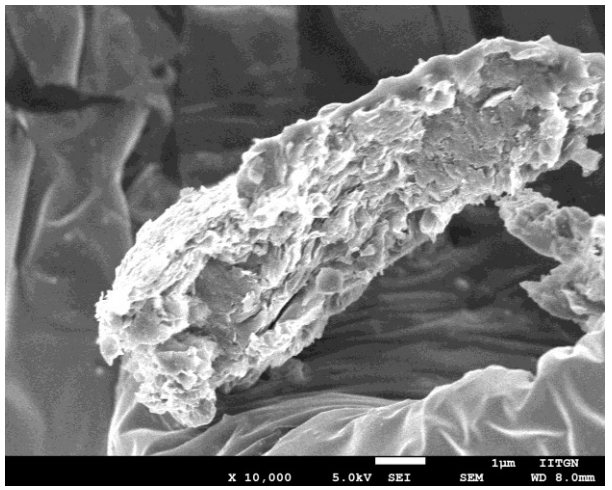
2. Wet Tests

Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
	1	2	3	4	5	6	7
A							

5. Volume Change: no volume change, large volume change







Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
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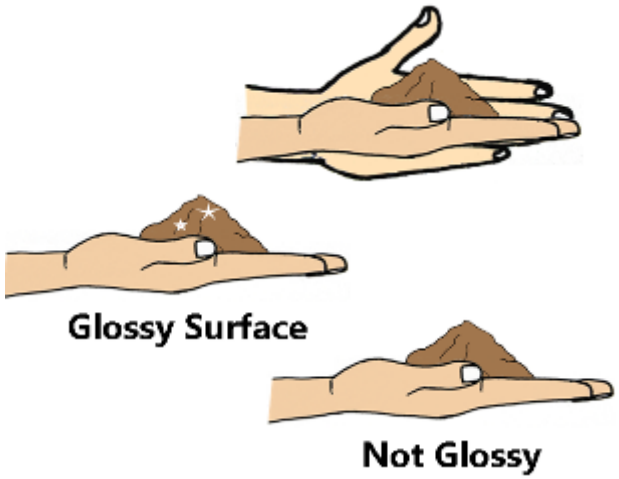
6. Dilatancy: Water appears on surface as **slow, intermediate, fast/quick**

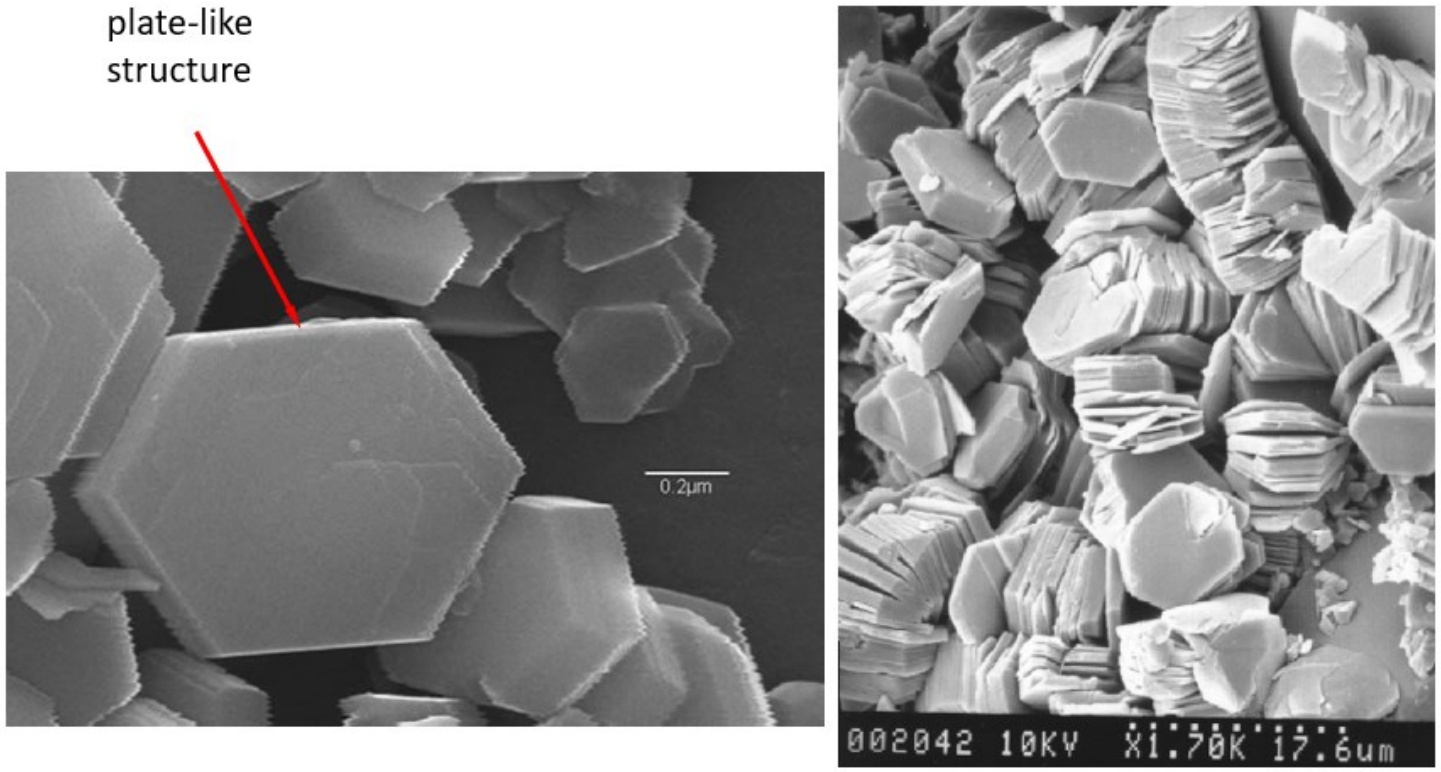
Procedure: Take a small representative sample in the form of a soil pat of the size of about 5 cc and add enough water to nearly saturate it. Place the pat in the open palm of one hand and shake horizontally striking vigorously against the other hand several times. Squeeze the pat between the fingers. The appearance and disappearance of the water with shaking and squeezing is referred to as reaction intensity of phenomena observed.

(A) REACTION TO SHAKING.

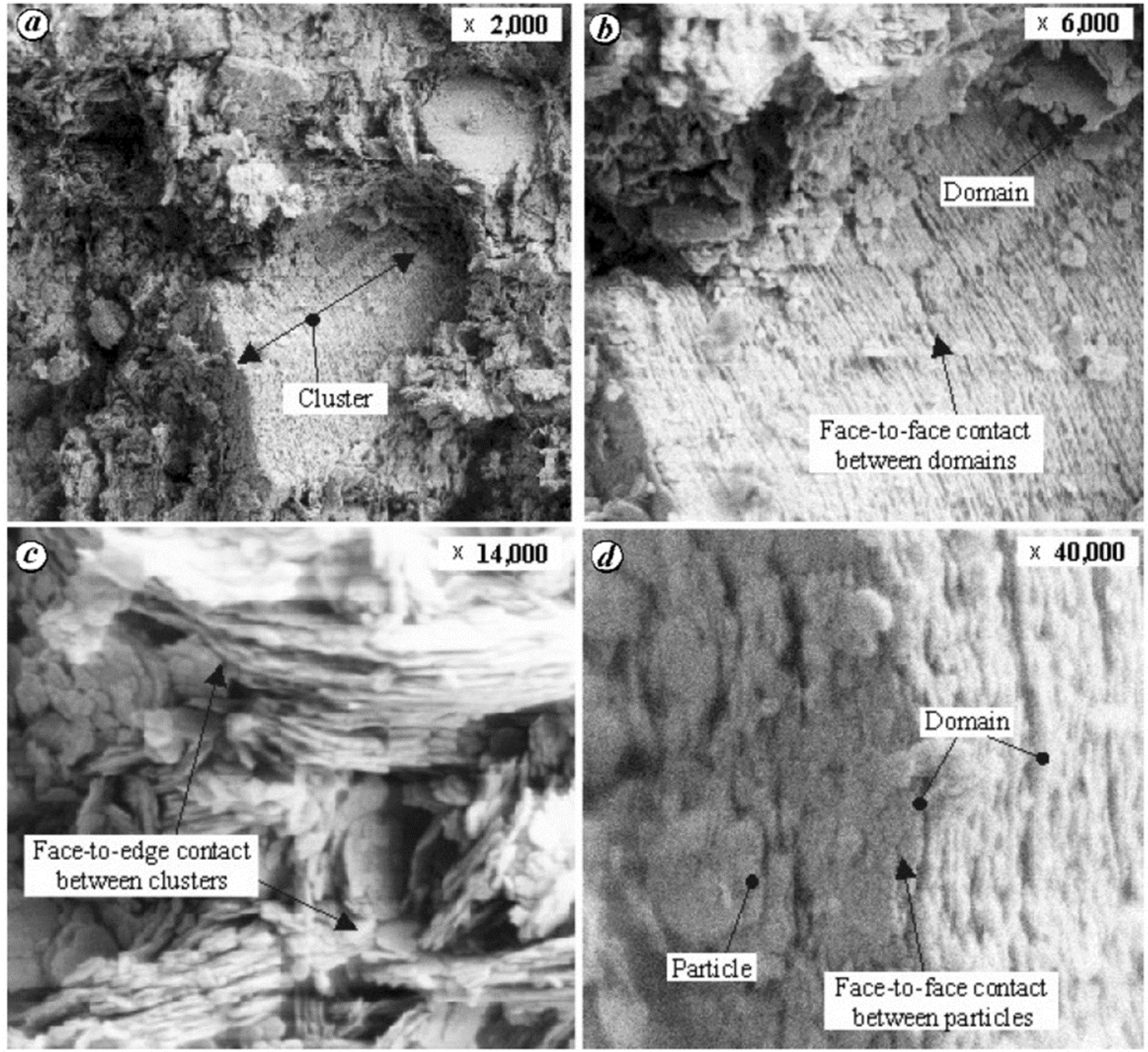
(B) REACTION TO SQUEEZING.



3. Microscopic Investigation



SEM image of Kaolinite clay


a
x 2,000
Cluster
b
x 6,000
Domain
Face-to-face contact
between domains
c
x 14,000
Face-to-edge contact
between clusters
d
x 40,000
Domain
Particle
Face-to-face contact
between particles

4. Mineral Identification