Lab Manual

Visual Classification of Soils

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

Property (Dry/wet)		Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
A	Predicted							
	Correct							

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: Red, Yellow, Brown, Reddish Brown, Grey, Dull White, Sparkling White etc.

Dry Tests

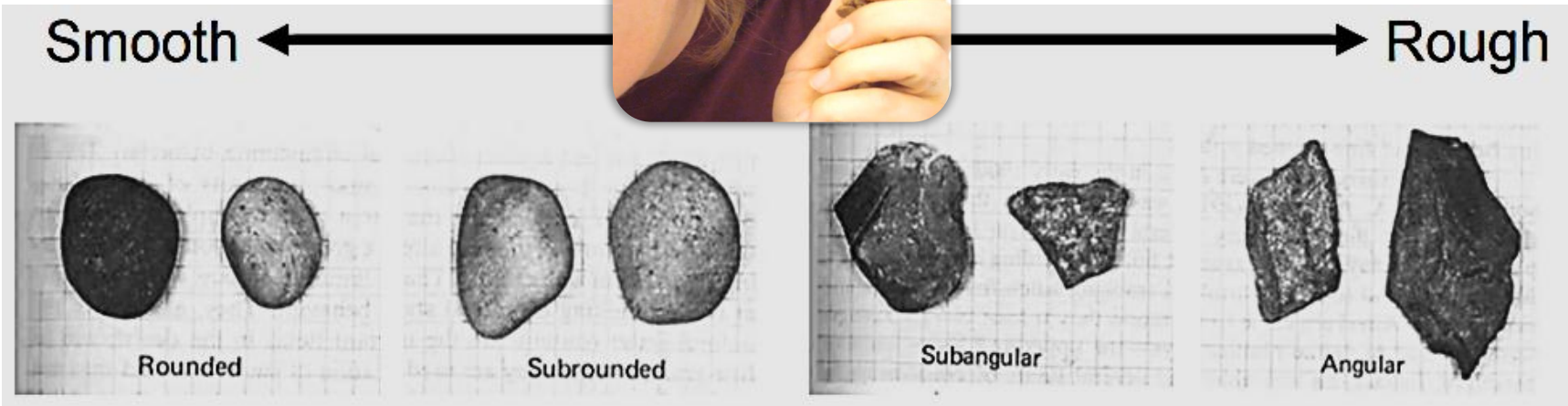
Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
	1	2	3	4	5	6	7
A							

2. Odour: **Odourous** (Pungent, ammonia, sulphur, etc.) or **Odourless**

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							

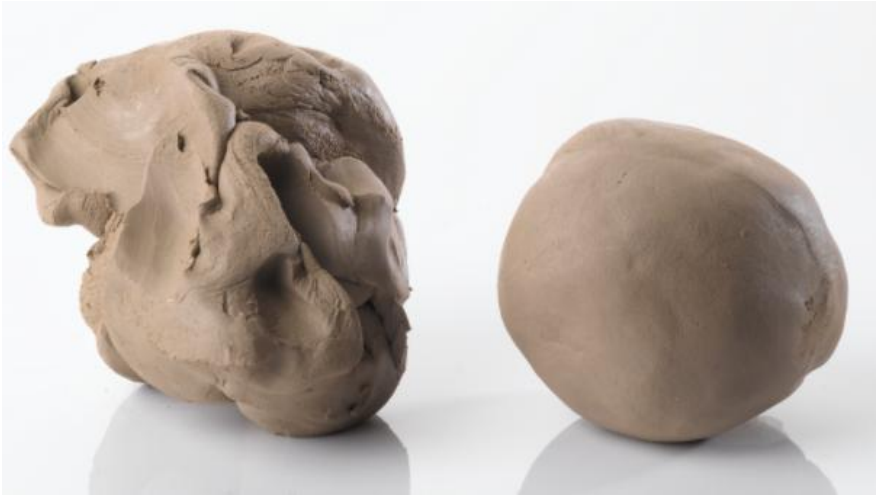
3. Texture: **Shape** (angular, subangular, rounded, subrounded, flaky/platy), **Surface Texture** (rough, smooth), **Appearance** (glossy, dull)



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							

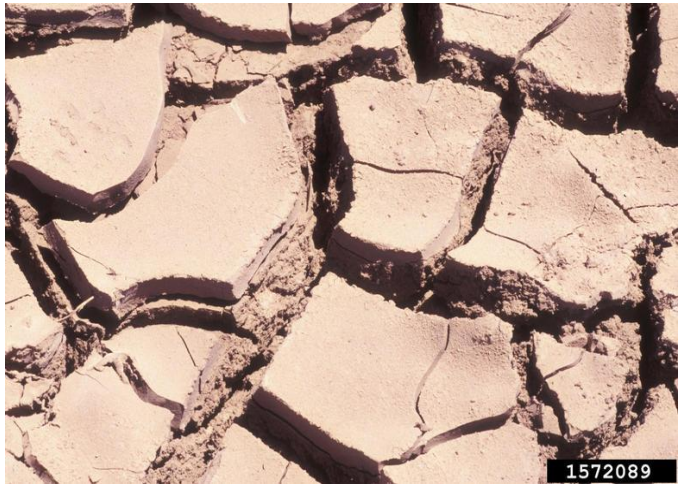
4. Grain Properties: Coarse & Fine

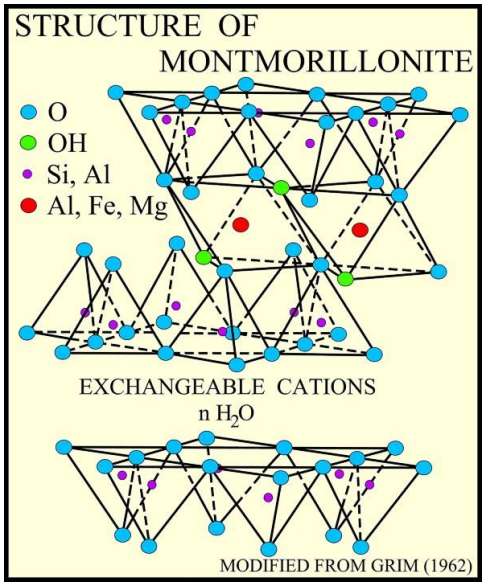


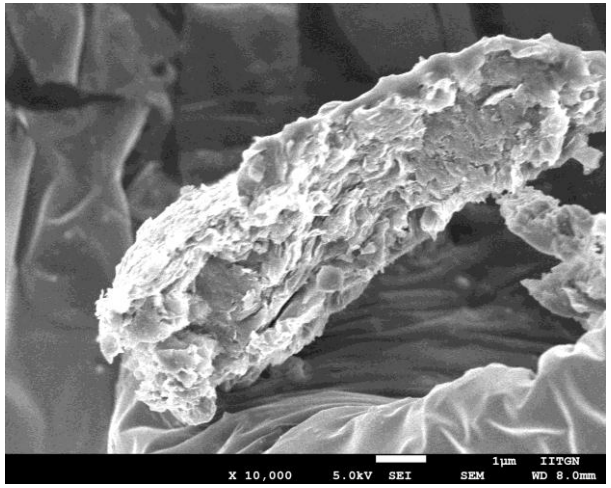
Wet Tests

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







Wet Tests

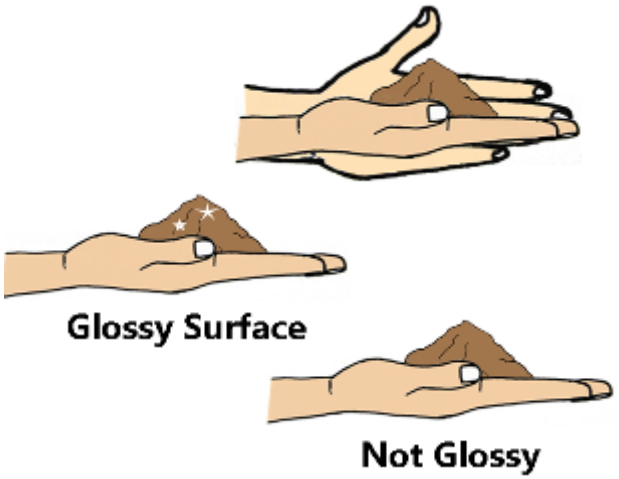
Sl. No.	Colour	Odour	Texture (appearance/shape)	Grain Properties (coarse/fine)	Volume Change (expands with water)	Dilatancy	Type of Soil
	1	2	3	4	5	6	7
A							

6. Dilatancy: water appears on surface as **slow, intermediate, fast/quick**

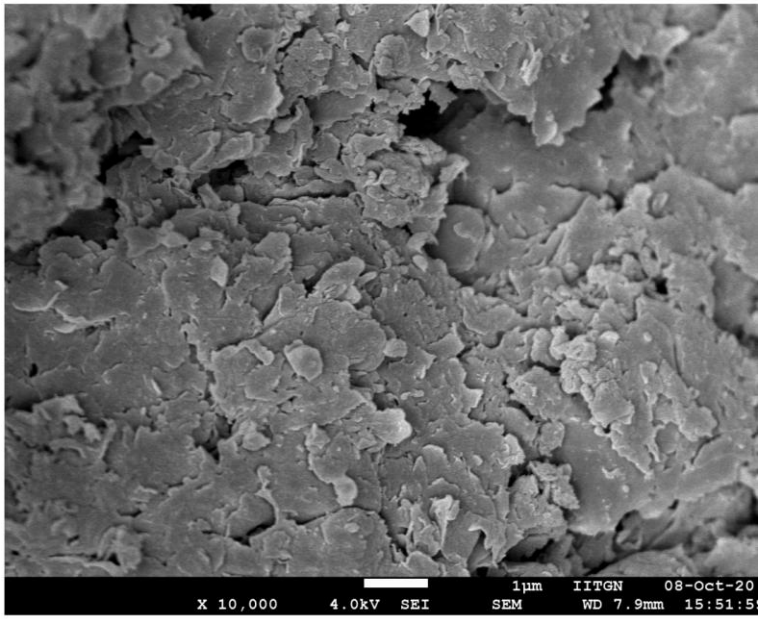
Procedure: Take a small representative sample in the form of a soil pat of the size of about 5 cc and add enough water to nearly saturate it. Place the pat in the open palm of one hand and shake horizontally striking vigorously against the other hand several times. Squeeze the pat between the fingers.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

(A) REACTION TO SHAKING.

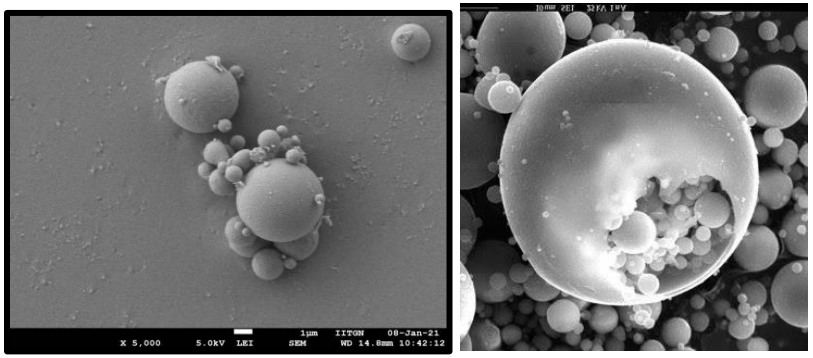
(B) REACTION TO SQUEEZING.



Microscopic Investigation (SEM)

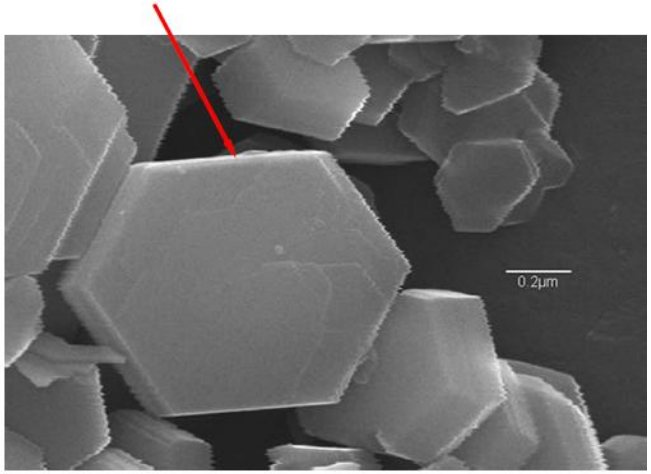


Natural expansive soil

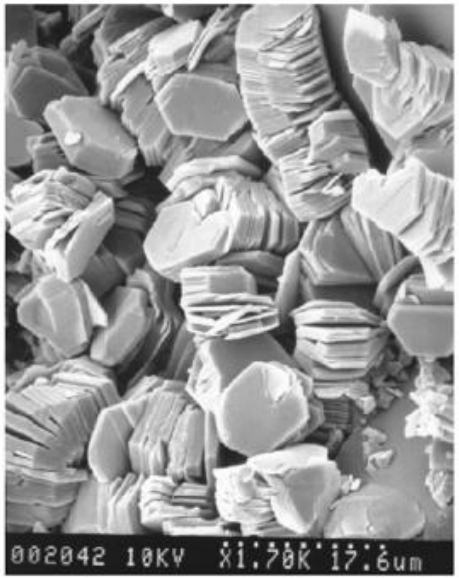


Fly Ash

plate-like structure



Kaolinite



Results

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	**Light Brown**	**Odourless**	**Smooth Powdery, Dull**	**Fine**	**Huge Volume Change**	**Very Slow**	**Clay/High Plastic Clay/ Expansive Clay**

Remarks

1. Colour: Red, Yellow, Brown, Reddish Brown, Grey, Dull White, Sparkling White etc.

2. Odour: Odourous (Pungent, ammonia, sulphur, etc.) or Odourless

3. Texture: Shape (Rounded, Subrounded, Angular, Subangular, Flaky/Platy); Texture (Rough, Smooth); Appearance (Glossy, Dull)

4. Grain Properties: Coarse, Fine, Coarse & Fine

5. Volume Change: No change, Moderate change, Huge change

6. Dilatancy: Not Possible, Slow, Intermediate, Fast

7. Type of Soil: Gravel, Sand, Silt, Clayey sand, Clayey silt, Clay, Gravelly clay, Micaceous silt, Mica, Fly ash etc.