

9. Slake Test

The slake test measures the stability of soil when exposed to rapid wetting. This test is qualitative and should be measured on air-dried soil fragments or aggregates.

Materials needed to measure slaking:

- **complete soil stability kit**
- **sampling scoop**
- **distilled water (1 L)**

Did You Know?

Soil stability serves as a qualitative indicator of soil biological activity, energy flow, and nutrient cycling. Binding of soil particles must constantly be renewed by biological processes.

Considerations: The soil should be **air-dry** when performing this test. If the soil is not dry, collect surface fragments as described in Step 1 and allow them to dry. Be careful not to destroy the soil fragments while sampling.

① Collect Surface Fragments

- Carefully remove soil fragments or aggregates from the soil surface. If there is a surface crust, carefully sample pieces of it. Use the **flat end** (handle) of the scoop to lift out surface and subsurface fragments. If the soil has been tilled, collect some aggregates (about 1 cm in size). Be careful not to shatter the soil fragments or aggregates while sampling.
- Collect 16 separate soil fragments. If there is a surface crust, collect eight fragments of the crust and eight fragments from below the crust.



Figure 9.1

② Fill Box with Water

- Remove all sieve baskets from the stability kit.
- Fill the compartments in the box with water. The water should be 2 cm deep and at approximately the same temperature as the soil.



Figure 9.2

③ Test Soil Fragments

- Place soil fragments in the sieve baskets (Figure 9.1).
- Lower one of the sieves into a box compartment filled with water (Figure 9.2).

④ **Observe Fragments**

- Observe the soil fragment for **five minutes**. Refer to the stability class table below to determine classes 1 and 2.
- After five minutes, raise the basket out of the water, then lower it to the bottom. It should take one second for the basket to clear the surface and one second to return to the bottom.
- Repeat immersion four times (total of five immersions). Refer to the stability class table below to determine classes 3 through 6.

⑤ **Record Ratings**

- Soil stability is rated according to the time required for the fragment to disintegrate during the five-minute immersion and the proportion of the soil fragment remaining on the mesh after the five extraction-immersion cycles. **[See table below.]**
- Record the stability ratings for all 16 soil fragments or aggregates on the Soil Data worksheet.

Stability class	Criteria for assignment to stability class (for “Standard Characterization”)
0	Soil too unstable to sample (falls through sieve).
1	50 % of structural integrity lost within 5 seconds of insertion in water.
2	50 % of structural integrity lost 5 - 30 seconds after insertion.
3	50 % of structural integrity lost 30 - 300 seconds after insertion or < 10 % of soil remains on the sieve after 5 dipping cycles.
4	10 - 25% of soil remaining on sieve after 5 dipping cycles.
5	25 - 75% of soil remaining on sieve after 5 dipping cycles.
6	75 - 100% of soil remaining on sieve after 5 dipping cycles.