

### Answer on Question #82106, Chemistry/ General Chemistry

a core ring with diameter of 4cm and a height of 5cm, the weight of the core ring with the undisturbed soil is 120g. the weight of the core ring with soil after oven drying for 24 hours is 105g. the volume occupied by air ( $V_{air}$ ) in the undisturbed soil sample is 16cm<sup>3</sup>. taking a particle density of the soil to be 2.65g/cm<sup>3</sup>, calculate the bulk density

#### Solution

The soil bulk density (BD), also known as dry bulk density, is the weight of dry soil ( $M_{solids}$ ) divided by the total soil volume ( $V_{soil}$ ). The total soil volume is the combined volume of solids and pores which may contain air ( $V_{air}$ ) or water ( $V_{water}$ ), or both.

Find the volume of core ring

$$V_{soil} = V_{core\ ring} = \pi r^2 \times h = \pi (d/2)^2 \times h = 3.14 \times (4/2)^2 \times 5 = 62.8\ cm^3$$

$$BD = M_{solids} / V_{soil} = 105\ g / 62.8\ cm^3 = 1.67\ g/cm^3$$

**Answer: 1.67 g/cm<sup>3</sup>**

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