1. A 1-L plastic bottle containing 500 mL of benzene with a specific gravity of 0.876 was left uncapped for two days in a tightly locked container with dimensions of 5 m length, 2 m height and 3 m width. During this time, about half of bottle was observed to be volatilized. What would be the concentration of benzene in the container in terms of ppmV? Assume the container temperature was 20 oC.
2. After underground storage (UST) tanks were removed (UST), four soil borings were installed, and soil samples were taken at certain depths. Based on the laboratory analytical results and subsurface geology, the area of the plume at a few depths were determined as follows:

|  |  |
| --- | --- |
| Depth |  |
|  (m) | Area of the plume (m2) |
| 3 | 0 |
| 4.5 | 20 |
| 6.5 | 40 |
| 8 | 35 |
| 9.5 | 0 |

Determine the volume and mass of the contaminated soil left in the vadose zone. Assuming that the bulk density of the soil is 1.75 g/cm3

1. Two 20 m3 UST and one 15 m3 UST were removed from a site at a gas station. The excavation resulted in in a tank pit of 15m x 7.5 m x 6 m. The in-situ bulk density (before excavation) is 1.8 g/cm3. After excavation, the excavated soil was stockpiled on-site, and there representative samples were taken from the pile. The analysis of the samples showed TPH concentrations of 80, 1800 and 2200 ppm.
2. estimate mass and volume of the excavated soil.
3. Estimate the total mass of TPH in the pile (kg).
4. Estimate the volume of TPH in the pile assuming the TPH has a density of 0.8 g/cm3.