

## Answer on Question #45025 – Chemistry – Other

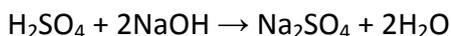
### Question

If 49 grams of  $\text{H}_2\text{SO}_4$  react with 80 grams of NaOH, how much reactant will be leftover after the reaction is complete?

- A) 24.5 g of  $\text{H}_2\text{SO}_4$
- B) none of either compound
- C) 20 g of NaOH
- D) 40 g of NaOH
- E) 60 g of NaOH

### Solution

The chemical equation is as follows



Molar masses of the reactants are  $M(\text{NaOH}) = 40 \text{ g/mol}$ ,  $M(\text{H}_2\text{SO}_4) = 98 \text{ g/mol}$ .

As is clear from the reaction stoichiometry 1 mol of  $\text{H}_2\text{SO}_4$  react with 2 mol of NaOH, or 1 mol  $\cdot 98 \text{ g/mol} = 98 \text{ g}$   $\text{H}_2\text{SO}_4$  react with 2 mol  $\cdot 40 \text{ g/mol} = 80 \text{ g}$  NaOH, so we can write the following proportion:

98 g ( $\text{H}_2\text{SO}_4$ ) – 80 g (NaOH)

49 g ( $\text{H}_2\text{SO}_4$ ) – X g (NaOH), whence

$X = 49 \cdot 80 / 98 = 40 \text{ g}$  – mass of NaOH needed to completely neutralize 49 g of  $\text{H}_2\text{SO}_4$ .

Since 80 g of NaOH is taken,  $80 - 40 = 40 \text{ g}$  of NaOH will be leftover after the reaction is complete.

**Answer: D) 40 g of NaOH**