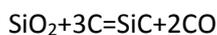


How do you find percentage yield? For example, reacting 991 mol of SiO<sub>2</sub> with excess carbon yield 30.0 kg of SiC.

**Solution:**

Write the equation for the reaction:



In chemistry, the reaction yield is the amount of product produced by a chemical reaction. The theoretical yield is the maximum amount of product that can be produced in a perfectly balanced reaction, but the actual yield is usually less than the theoretical yield. To express the efficiency of a reaction, calculate the percent yield using this formula:

$$\% \text{yield} = \frac{m(\text{SiC})_{\text{actual}}}{m(\text{SiC})_{\text{theoretical}}} * 100\%$$

By the reaction equation we find the amount of substance of SiC:

$$\frac{n(\text{SiO}_2)}{n(\text{SiC})} = \frac{1}{1}$$

$$n(\text{SiC}) = n(\text{SiO}_2) * 1 = 991 * 1 = 991 \text{ mole}$$

Find the mass of SiC, which can theoretically be formed:

$$m(\text{SiC})_{\text{theoretical}} = n(\text{SiC}) * M(\text{SiC})$$

$$m(\text{SiC})_{\text{theoretical}} = 991 \text{ mole} * 40.096 \frac{\text{g}}{\text{mole}} = 39735.3 \text{ g} = 39.7353 \text{ kg}$$

Calculate the percent yield of SiC:

$$\% \text{yield} = \frac{30.0 \text{ kg}}{39.7353 \text{ kg}} * 100\% = 75.5\%$$

**Answer:** percent yield of SiC 75.5%