

Question #80191, Chemistry / General Chemistry

Question:

If the percent yield of the reaction is only 85% using 100.0 kg of ammonia. What is the actual yield of ammonium sulfate?

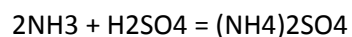
Select one:

- a. 329.5 kg
- b. 85 kg
- c. 170 kg
- d. 659.1 kg

$m(\text{NH}_3) = 100 \text{ kg}$

$m((\text{NH}_4)_2\text{SO}_4) = ?$

Solution:



$M(\text{NH}_3) = 17 \text{ g/mol}$

$M((\text{NH}_4)_2\text{SO}_4) = 132 \text{ g/mol}$

$m((\text{NH}_4)_2\text{SO}_4) = x$

$100000 / (17 \cdot 2) = x / 132$, $x = 388235 \text{ g} = 388 \text{ kg}$ - theoretic mass

Real mass: $m_r = 0.85 \cdot m = 388 \cdot 0.85 = 329 \text{ kg}$

Answer: a. 329.5 kg