

Answer on Question # 60392 - Chemistry - General Chemistry

The solubility of calcium hydroxide is 76g per 100g of water at 30 degrees Celsius and 192g per 100g water at 90 degrees Celsius. What mass of calcium hydroxide will crystallise out if a solution of 350 tonnes of saturated solution is cooled from 90 to 30 degrees Celsius. Calculate the yield of calcium hydroxide.

Solution

Cooling a saturated solution containing 100 g of water and 192 of a salt from 90 to 30 degrees, the mass of precipitate will be $192 - 76 = 116$ g.

The yield is the ratio of the mass of precipitate and total mass of compound:

Yield = $116/192 = 0.604$, or **60.04 %**.

To calculate the mass of calcium hydroxide will crystallise out if a solution of 350 tonnes of saturated solution is cooled from 90 to 30 degrees Celsius, the proportion should be composed:

192 tonnes of solution gives 116 tonnes of calcium hydroxide;

350 tonnes of solution gives x tonnes of calcium hydroxide;

$x = 350 \cdot 116 / 192 = \mathbf{211.5}$ tonnes.