

## Answer on Question #84016 – Chemistry – General Chemistry

### Question

How many grams of  $MgCl_2 \times 6H_2O$  am I supposed to dissolve in 5 liter barrel of distilled water to get 20 mg/l of  $Mg^{2+}$ ?

### Solution

5 liters of solution contain  $20 \text{ mg/l} \times 5 \text{ l} = 100 \text{ mg} = 0.1 \text{ g}$  of  $Mg^{2+}$ . One mole of magnesium chloride hexahydrate weights  $M(MgCl_2 \times 6H_2O) = M(Mg) + 2M(Cl) + 12M(H) + 6M(O) \approx 24 + 2 \times 35,5 + 12 \times 1 + 6 \times 16 = 203 \text{ (g/mol)}$ , and it contains one mole of magnesium ions ( $M(Mg) \approx 24 \text{ g/mol}$ ). Therefore, there is a proportion:

$203 \text{ g of } MgCl_2 \times 6H_2O \text{ contains } 24 \text{ g of } Mg^{2+};$   
 $X \text{ g of } MgCl_2 \times 6H_2O \text{ contains } 0.1 \text{ g of } Mg^{2+}.$

$$\frac{203}{X} = \frac{24}{0.1}$$

$$X = \frac{203 \times 0.1}{24} \approx 0.8458$$

Thus, to get 5 liter of solution with 20 mg/l of  $Mg^{2+}$  you suppose to dissolve 0.8458g, or 845.8mg of  $MgCl_2 \times 6H_2O$ .

**Answer:** you need 0.8458g of  $MgCl_2 \times 6H_2O$ .

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