Snowflake Problem

Sample Problem

* Determine how many molecules are in the average snowflake.
* Given: It has been determined that the average snowflake weighs 1 mg
* *HINT, careful with your units here!!

Solution

* Convert from mass to moles
  * Mass = 0.001 g
  * M_{water} = 2(H) + O = 2(1.01) + 16 = 18.02 g/mol

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n= 0.000055 mol

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n= 0.001/ 18.02
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Therefore there are 0.000055 mol in a snowflake

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* Convert from moles to particles
  * n= 0.000055
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$N = n \times Na$
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$N = 3.3 \times 10^{19}$

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$N = n \times Na$
$N = 0.000055 \times 6.02 \times$
$N = 3.3 \times 10^{19}$

Therefore there are 3.3×10^{19} atoms in a snowflake