#67200 Chemistry, Other

What is the molecular mass of a molecular compound with a freezing point -0.520 degrees C when 6.21 g is dissolved in 500 g of water?

Answer:

$\Delta T_{fr} = Km$ $m = n/mass$ $n = m/M$

$K_{water} = 1.86\ K \cdot mol^{-1} \cdot kg$

$0.520 = 1.86 \cdot m$

$m = 0.28\ mol/kg$

$n = mass \cdot m = 0.5 \cdot 0.28 = 0.14\ mol$

$M = m/n = 6.21/0.14 = 44.36\ g/mol$