Imagine that you have 100 moles total mixture, 7 moles acrylamide, 93 moles of the water.

The weights of the mixture components are 7 moles*71.08 g/mol = 497,56 g acrylamide, and 93 moles * 18.02 g/mole = 1675,86 g of the water.

The total mixture is 497,56 g + 1675,86 g = 2173,42 g and the weight ratio of styrene to total mixture is 497,56 g g/2173,42 g * 100% = 23% by mass.

w=23% / 100% =0.23

w of dissolved compound = m of dissolved compound / m of solvent + m of dissolved compound.

w = x / 15 g + x .

0.23 = x / 15 g + x .

x = 3,45 + 0.23x

0,77x=3,45

x=4, 5 g

The mass is 4.5 g