## Answer on Question #49009 - Chemistry – Inorganic Chemistry

**Question**

What is the chemical formula of 58.9% Na 1% S

**Answer:**

It looks like it is a mistake in the question – if this compound contains only Na and S, then the mass percent of S should be 100 % – 58.9 % = 41.1 %.

Assume we have 100 g of the compound. From the given mass percents of the elements in the compound, we can determine the mass of the element. This means that we have 58.9 g of Na and 1 g of S.

Convert each mass to moles using the molar mass of the element. Number of moles of sodium in 100 g sample:

$$n(Na) = \frac{m(Na)}{M(Na)} = \frac{58.9}{23.0} = 2.56\ mol$$

Number of moles of sulfur in 100 g sample:

$$n(S) = \frac{m(S)}{M(S)} = \frac{41.1}{32.1} = 1.28\ mol$$

The number of moles can then be converted into a lower terms ratio of the element to get the empirical formula:

$$\frac{2.56}{1.28} : \frac{1.28}{1.28} = 2.00 : 1.00 = 2 : 1$$

So, the chemical formula of the compound is $Na_2S$.

**Answer:** $Na_2S$