

## Answer on Question #54714 – Chemistry – General chemistry

### Question:

Saccharin,  $C_7H_5NO_3S$

Express the percent compositions to three significant digits separated by commas.

### Answer:

The molecular mass of saccharine is calculated by the equation:

$M = 7M(C) + 5M(H) + M(N) + 3M(O) + M(S)$ , where  $M(X)$  – the atomic weight of element X ( $C = 12$ ,  $H = 1$ ,  $N = 14$ ,  $O = 16$ ,  $S = 32$ ).

$$M = 84 + 5 + 14 + 48 + 32 = 183$$

The percentage composition of each element equal:

$W(X) = [(N \times M(X)) / M] \times 100\%$ , where  $N$  – the number of atoms for element X.

Thus,

$$W(C) = [(7 \times 12) / 183] \times 100\% = 45,9 \%$$

$$W(H) = [(5 \times 1) / 183] \times 100\% = 2,73 \%$$

$$W(N) = [(1 \times 14) / 183] \times 100\% = 7,65 \%$$

$$W(O) = [(3 \times 16) / 183] \times 100\% = 26,2 \%$$

$$W(S) = [(1 \times 32) / 183] \times 100\% = 17,5 \%$$