Molarity of aspirin

We can consider some rudimentary pharmacology using our knowledge of molar mass of aspirin. Aspirin has a chemical formula $C_9O_4H_8$. Assuming that a grown person takes 1 gram of aspirin and that all of the aspirin is taken up into the blood stream (total volume is 5 liters), then what is the concentration of aspirin in the blood (in units of molarity)?

Molarity of aspirin

Assuming that 1 gram of aspirin ($C_9O_4H_8$) is taken up into the blood stream (total volume is 5 liters) what is the molarity?

Solution: We need to calculate the number of moles.

First, the M_m = 9(12) + 4(16) + 8 = 180 gm/mol

Therefore,

$$n = \frac{m}{M_m} = \frac{1\ gm}{180\ gm/mol} = 0.0055\ mol$$

This number is dissolved in 5 L.

$$c = \frac{n}{V} = \frac{0.0055\ mol}{5\ L} = 0.0011\ M$$