

If 173 g of a radioactive iron ( $^{59}\text{Fe}$ ) is received in the lab today, what percentage of the original is left after 270 days?

$$m_0(^{59}\text{Fe}) = 173 \text{ g}$$

$$t = 270 \text{ days}$$

$$T_{1/2} = 44,495 \text{ days} \sim 45 \text{ days}$$

$$w\%(m_1) - ?$$

The mass of the radioactive substance is reduced by law:

$$m(t) = m_0 \cdot 2^{-\frac{t}{T}}$$

$$m(t) = 173 \cdot 2^{-(270/45)} = 173 \cdot 0.016 = 2.768 \text{ g}$$

$$m_1 = m_0 - m(t) = 173 - 2.768 = 170.232 \text{ g}$$

$$w\%(m_1) = m_1 / m_0 \cdot 100\%$$

$$w\%(m_1) = 170.232/173 \cdot 100\% = 98.4\%$$

Answer provided by [www.AssignmentExpert.com](http://www.AssignmentExpert.com)