

(4.13) The α -activity of a mixture of astatine isotopes was measured at different times after their separation giving the following results: Calculate the half-lives and their activity at $t=0$.

The standard method is graphical, but here we used a numerical fitting by minimizing the residuals:

$$i := 1 \dots 19$$

$$t_i := \quad R_i :=$$

12	756
17.2	725
23.1	638
30.0	600
37.7	545
47.5	494
59.5	435
73	380
87	341
102	288
121	256
140	215.5
161	178.5
184	150.7
211	127.3
243	101.9
276	84.9
308	68.2
340	55

$$a1 := 507 \quad t1 := 107$$

$$a2 := 440 \quad t2 := 24$$

$$A1_i := a1 \cdot \exp\left(\frac{-\ln(2)}{t1} \cdot t_i\right)$$

$$A2_i := a2 \cdot \exp\left(\frac{-\ln(2)}{t2} \cdot t_i\right)$$

