8 Stable isotope of gold has an atomic number of 79 and a mass number of 197. A sample of pure gold is irradiated with neutrons to produce a small proportion of the radioactive isotope of gold of mass number 198.

(a) If chemical analysis of the sample subsequently showed that it contained a trace of mercury of atomic number 80, state and explain what you would conclude from this analysis about the radiation of the radioactive gold.

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……..……. [2]

(b) **(i)** The half-life of the radioactive isotope of gold is 2.69 days.

With reference to your answer in **(a)** or otherwise, suggest a possible use for radioactive gold. Explain your answer.

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……..…… [2]

(ii) A sample of Gold-198 has an activity of 64 kBq when it was initially measured.

1. Calculate the mass of radioactive isotope of Gold-198 present in the sample.

mass = …… g [2]

2. Calculate the activity after 13.5 days.

activity = …… kBq [2]