Isotope kills ex-spy

The case is unique. It had us baffled at first.

Changing conclusions

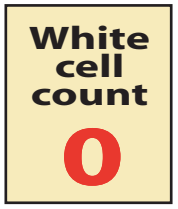
1/11

He eats raw fish and starts vomiting. He probably has **food poisoning.**

11/11

He's much worse. He has enemies. He may have been **poisoned**, but what with?

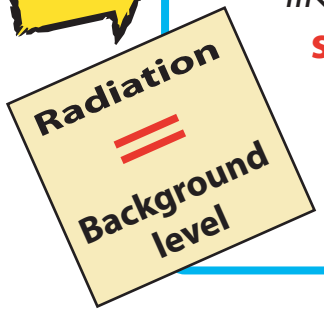
17/11



His hair falls out. **Thallium** causes hair loss, and it destroys white blood cells.

21/11

His X-rays are clear. It can't be thallium. It looks like **radiation sickness**, but he's not radio-active.



23/11

His urine's radioactive. He may have swallowed an **alpha source**. His skin was blocking the radiation.

24/11

We've checked the decay rate. It's definitely **polonium-210**.

Most people have never heard of polonium. They're asking what it is and how it kills you.

Prepare a 2 minute talk to answer their questions.

Polonium-210

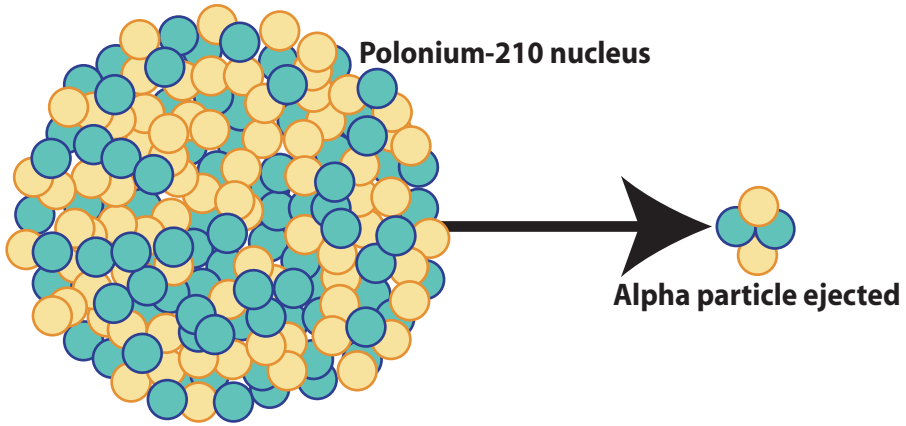
$^{210}_{84}Po$

Polonium has 25 isotopes with different numbers of neutrons. They all have 84 protons. 210 is this isotope's mass number – which shows it has 126 neutrons.

Group	3	4	5	6
	^{81}Tl	^{82}Pb	^{83}Bi	^{84}Po
	thallium	lead	bismuth	polonium

Polonium is a soft silvery grey metal, like the metals near it in the Periodic Table. It makes white salts and some of these dissolve.

Alpha radiation can't get through your skin, but polonium-210 can kill you from the inside. The metal itself is toxic – like lead and mercury – but the radiation adds to the damage. 1 microgram, the size of a speck of dust, could be fatal.



Polonium-210 is a radio-isotope because its nucleus is unstable. Sooner or later it decays. A particle of alpha radiation gets emitted, and the nucleus becomes lead-206. The number of polonium-210 atoms halves every 138 days.

Alpha particles disrupt DNA and destroy dividing cells, so your hair falls out and your vital organs fail.