

Focus on poison that killed Russian spy

The investigation into the death of former spy Alexander Litvinenko will focus on the source of Polonium-210 found in his body. First isolated by Marie Curie in 1897, low concentrations occur naturally in the environment but an amount large enough to kill would have to be produced in a reactor

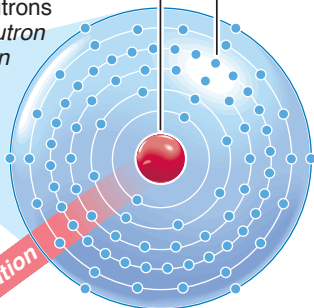
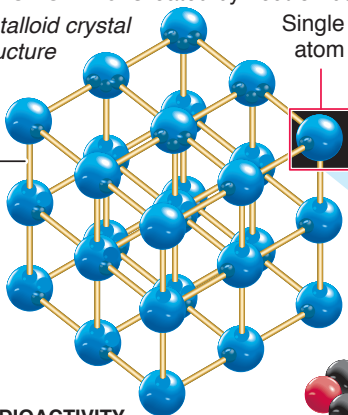
POLONIUM-210: Created by neutron bombardment of **bismuth** atoms in reactor

Metalloid crystal structure

Single atom

Nucleus: 84 protons
125 neutrons
Low neutron to proton ratio

Electrons



Proton

Neutron

RADIOACTIVITY

Unstable isotope ejects high-energy subatomic particles – 5,000 times more than radium. All elements with over 82 protons are radioactive

Half-life: Time taken to halve radioactive decay

138.4 days

Polonium-210 emits only **alpha particles**. These are unable to pass through paper or skin but, if ingested, can penetrate several layers of cells of soft internal tissues, causing massive cell damage

Beta particles Will pass through 1-2cm of human tissue

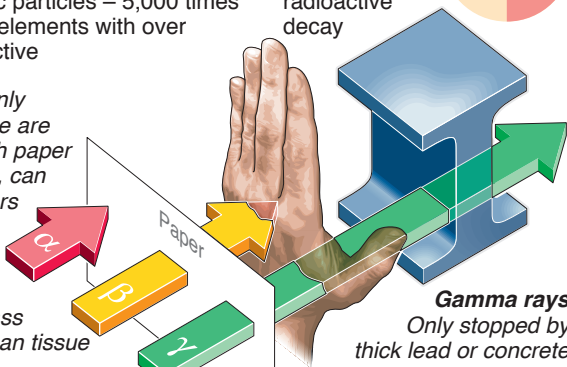
LETHAL DOSE: Weight-for-weight toxicity

Hydrogen cyanide (fatal at 300 parts/million)

Polonium-210 250 billion times more toxic

Biological half-life: Time for half amount to be cleared from human body

30-50 days



Gamma rays
Only stopped by thick lead or concrete