

# What is polonium-210 and how can it kill?

Jill Lawless, AP

LONDON (AP) -- Polonium first hit the headlines when it was used to kill KGB agent-turned-Kremlin critic Alexander Litvinenko in London in 2006.

This week, Yasser Arafat's widow has called for the late Palestinian leader's body to be exhumed after scientists in Switzerland found elevated traces of radioactive polonium-210 on clothing he allegedly wore before his death in 2004.

What is polonium and how dangerous can it be?

### WHAT IS POLONIUM?

Polonium-210 is one of the world's rarest elements, discovered in 1898 by scientists Marie and Pierre Curie and named in honor of her country of origin, Poland. It occurs naturally in very low concentrations in the Earth's crust and also is produced artificially in nuclear reactors. In small amounts, it has legitimate industrial uses, mainly in devices to eliminate static electricity.

### IS IT DANGEROUS?

Very. If ingested, it is lethal in extremely small doses. Less than 1 gram (0.04 ounces) of the silver powder is sufficient to kill. A 2007 study by radiation experts from Britain's Health Protection Agency concluded that once polonium-210 is deposited in the bloodstream, its potent effects are nearly impossible to stop. A poisoning victim would experience multiple organ failure as alpha radiation particles bombard the liver, kidneys and bone marrow from within. The symptoms shown by Litvinenko - nausea, hair loss, throat swelling and pallor - are also typical.

### WHO CAN GET THEIR HANDS ON IT?

The good news - not too many people. The element can be a byproduct of the chemical processing of uranium, but usually is made artificially in a nuclear reactor or a particle accelerator. These nuclear facilities are monitored and tightly regulated under international agreements.

John Croft, a retired British radiation expert who worked on the Litvinenko case, said a dose large enough to kill would likely have to come from a government with either civilian or military nuclear capabilities. That category includes Russia - producer of the polonium believed to have killed Litvinenko - and Arafat's foe, Israel. But it also includes dozens of other nations, including the United States.

### WHY WOULD IT BE ATTRACTIVE TO ASSASSINS?

Polonium makes a good weapon. Its large alpha particles of radiation do not

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penetrate the skin and don't set off radiation detectors, so it is relatively easy to smuggle across international borders. Polonium can be ingested through a wound or inhaled - but the surest method would be to have the victim consume it in food or drink. Litvinenko drank tea laced with polonium during a meeting at a luxury London hotel.

### **WHO HAS IT KILLED?**

Polonium poisoning is so rare that it took doctors several weeks to diagnose Litvinenko's illness and security experts struggled to think of a previous case. More than five years after Litvinenko's death, no one has been arrested. British prosecutors have named ex-KGB agent Andrei Lugovoi as their chief suspect, but Russia refuses to hand him over.

Some speculate that the Curies' daughter Irene, who died of leukemia, may have developed the disease after accidentally being exposed to polonium in the laboratory.

Israeli author Michal Karpin has claimed that the cancer deaths of several Israeli scientists were the result of a leak at the Weizmann Institute of Science in 1957. Israeli officials have never acknowledged a connection.

### **CAN SCIENTISTS PROVE WHETHER ARAFAT WAS POISONED WITH POLONIUM?**

Scientists caution that traces on Arafat's clothing aren't sufficient proof of poisoning. Exhuming his body would be a surer method. Derek Hill, a radiological science expert at University College London, said eight years after Arafat's death in 2004, any polonium would have decayed and would be far less radioactive than it was at the time. But he says it would still be much higher than normal background levels, and with an autopsy it should be possible to tell "with a pretty high confidence" whether Arafat had polonium in his body when he died.

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