

## The murder/assassination of Alexander Litvinenko by $^{210}\text{Po}$ poisoning.

On November 1, 2006, Alexander Litvinenko, a former KGB agent, was given a dose of  $^{210}\text{Po}$  that resulted in his death 23 days later. Since this method of intoxication by a radioactive substance is unprecedented, there are many potential issues and questions that you may want to explore. Feel free to pursue any thread that is of interest. But we need to keep some of your work focused on the toxicology and environmental chemistry involved in this phenomenon. You may start your paper by defining what are the radioactive materials.

At minimum for this paper, you should investigate:

- a) Introduction: should cover the discovery of radioactivity. (History)
- b) Radioactive decay, Isotopes, nuclear reactions, nuclear stability, nuclear decay, and types of radiations.
- c) Application and effects of nuclear reactions.
- d) The toxic mechanism of  $^{210}\text{Po}$ . Specifically, what did  $^{210}\text{Po}$  do to Mr. Litvinenko to kill him? (You may find that there are a number of ways that  $^{210}\text{Po}$  can be lethal. Just concentrate on what actually killed Mr. Litvinenko, if that is known. (Bio-Chem., Anatomy, Forensic)
- e) Under what circumstances is  $^{210}\text{Po}$  found naturally in the environment.
- f) Can  $^{210}\text{Po}$  be produced artificially? If so, how?
- g) If Mr. Litvinenko had been given a dose of 1  $\mu\text{g}$  (micro-gram) of  $^{210}\text{Po}$  on November 1, how much was left the day he died on November 23?
- h) You may want to consider how a different (larger) dose of  $^{210}\text{Po}$  would have worked. Would he have died sooner from failure of a different organ or body part?

### **Instructions**

- 1- Type at least 3 full pages (double space) not including photos, graphs, charts and references (you can use this paper as a checklist) to be sure none of the above points is missing.
- 2-Your work should include a cover page (your name, period number, teacher name, product name, course level, and date) also a *cited page (at least 5 different web-sites)*.
- 3-You should work in-group of two (max 2), (partner has to be from same period, one paper per group, be sure both your names on the paper, and both of you have an extra copy.
- 4- Your paper due date is **Nov 7th** (NO late work will be accepted).