

Re: Bismuth radioactive??

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Oscar Lanzi III wrote:

> *OK< I hadn't read your posting. :-)*

Oh Oscar, don't worry, it's quite reasonable it may happen.
Furthermore, thanks for giving me the opportunity
of better clarify my point of view :-)

> *In truth probably all elements have some radioactive isotopes. For*
> *"naturally occurring", however, things are tricky. Given the age of*
> *the Earth there has to be a half-life of billions of years or more, or*
> *some generation mechanism (eg., cosmic rays + atmosphere --> C-14).*

Agreed. OTOH, I've read (but can't remember the source)
a study in which it was stated that above a mass number
of ca. 140 nuclides are theoretically unstable wrt alpha
decay, IIRC, so please don't take it for granted, at least
exactly as such. BTW, is there anyone aware of something
like this, and maybe bothers to better explain?

I myself did some little calculations which show that even
the other isotopes of Pb (206; 207; 208) are potentially
unstable to alpha decay, in the sense that such decays
are exotherm. This comparing the specified nuclide's
atomic mass minus the alpha's one (4.00153 u), to the
Hg daughter nuclide's mass: these masses were taken in
<http://atom.kaeri.re.kr/ton/>
while the alpha one in
<http://hyperphysics.phy-astr.gsu.edu/hbase/nucene/imgnuk/nucbind.gif>
While Pb-208 and Pb-206 should end up to known 'stable'
isotopes (Hg-204 and Hg-202, resp.), Pb-207 should give
Hg-203 which, in turn, is known to decay beta- to Tl-203.
But although the above condition (exothermicity) is necessary,
I don't know if it's also sufficient. So it's mere speculation.

> *The lack of naturally occurring radioactive isotopes for one element,*
> *fluorine, is practically significant. Uranium enrichment via*
> *centrifugation of UF6 would not work (well) without F having only one*

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> *available isotope.*

Yes, you are right, I knew that. That feature you mention is quite spectacular, but perhaps others might be envisaged for the other 18 (or so) monoisotopic elements.

> --OL

Best regards,
Angelo