MATERIALS SCIENCE

Advanced Edit

Pyrochlore mineral preferentially ~~preferably~~ incorporates large amounts of Pu, U (up to 30 wt%~~wt~~), and Th~~Thorium~~ (up to 9 wt%~~wt.~~) in~~to~~ its structure [1-4]. The P~~p~~yrochlore~~s~~ structure is the primary consideration as immobilization barriers for utilization of excess weapons-grade plutonium and other radioactive elements [5-7]. Pyrochlore~~s~~ exists as large~~huge~~ polyhedra with coordination numbers of ~~ranging from~~ 7–8; this makes~~; which makes~~ them capable of accommodating~~hold~~ a wide variety of radio-nuclides (e.g., Pu, U, Ba, and Sr~~, etc.~~) as well as neutron position (e.g., Hf and~~,~~ Gd) [8]. Because of~~Due to~~ their high radiation tolerance, these are used largely ~~used~~ as combined inert matrix fuel forms and waste forms for the "burning" and final ~~disposing~~ disposal of Pu and ~~the~~ minor actinides [8]. Rare earth (RE, also known as lanthanides) titanate pyrochlores ($RE_2Ti_2O_7$, where RE = Lu to Sm, or Y) have potential for use as~~As~~ solid electrolytes and mixed ionic/electronic conducting electrodes [9], catalysts [5], and ferroelectric/dielectric device components [11–13]~~, Rare Earth (RE, also known an lanthanides) titanate pyrochlore (RE2Ti2O7, where RE = Lu - Sm, or Y) could be adopted~~.

Comment [A1]: The meaning of this part of the sentence is not entirely clear. Do you mean "is the prime candidate for use as a barrier for the immobilization of excess weapons-grade Pu and other radioactive elements"?

Comment [A2]: Please check whether the revision is correct.

Comment [A3]: "Neutron position" does not seem to be the most appropriate term in the present context. Please verify the accuracy of this term and revise it suitably if necessary.

Comment [A4]: If "these" here refers to "pyrochlores," then please replace "these" with "pyrochlores" for clarity.

Comment [A5]: The meaning of this phrase appears to be ambiguous. Do you mean "both inert matrix fuel forms and waste forms" or "a combination of inert matrix fuel forms and waste forms"? Please revise according to the intended meaning.

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