

flexible price mechanisms. Introduction of wireless nanocrystals is seen as a productive step in creating more efficient white-light-emitting diodes that will allow to reduce lighting costs.

To sum up, the design of a future energy system requires new long-term investments in research activities based on realistic potential assessments and careful adaptation of the individual supply chain components based on cutting-edge nanotechnologies.

References:

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Poisoning the reactor with Samarium

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There are two types of poisoning the reactor Fission poisoning and liquid poisoning. The first type is natural and the second one is manmade. The liquid poisoning type is used to prevent the accidents in the reactor and to decrease the consequences. But in this presentation we will consider the fission poisoning (referred to as poisoning).

Poisoning the reactor – the process of formation short-lived products of fission in the working reactor, which involved in unproductive capture of neutrons and thereby lowering the reactivity margin in their accumulation and increasing it when they decay.

Slagging of fuel – is the process of accumulation stable and long-lived fission products in the working reactor which involved in unproductive capture of thermal neutrons and thus lowering the reactivity margin reactor.

The element Samarium-194 is a strong slag of the first group. Its half-life is 13,84 years, it means that it's almost stable. But why do we say about poisoning rather than slagging the reactor?.

Yes, Samarium is a slag but its accumulating in fuel elements of the reactor has some peculiarities which make the process of changes in Samarium concentrating similar in quality to poisoning the reactor with Xenon. In difference to other slags, Samarium can not only be accumulated in a working reactor but can be bombarded by neutrons. Thus, losses of reactivity connected with Samarium accumulating can be either increased or decreased due to its intensive bombarding at high levels of the reactor power. That's why the process of Samarium accumulating was named poisoning rather than slagging.

Samarium isn't practically formed as a product of fission in the reactor. In this case almost all its formation is connected with beta-decay of another product of fission – Promethium-149. This element as a direct fragment of fission is also formed in small amounts. A basic source of its formation is beta -decay of Neodymium-149. Thus, the processes of formation and decreasing fission products can be shown as following.

References:

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