

## Novel Breeding & Shielding Materials for Future Fusion Reactors

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Fusion reactors need deuterium and tritium in order to produce fusion. Deuterium is commonly found in water, but tritium is highly radioactive and decays in 12yrs. Thus, it is necessary to produce tritium to maintain fusion. Lithium does this job because it captures neutrons and produce tritium. So, we put a lithium blanket surrounding the plasma. However, modern designs require beryllium, or lead, which are hazards for the workers that maintain the system and are difficult to manipulate. Aqueous lithium-salt blankets are much easier to manipulate and work as good neutron absorbents. We did a survey of different blanket materials to find the one that produces the most tritium and absorbs neutrons well. Promising materials that we found were LiOD.D2O, Li2O2, LiD, Li+D. Also, we did a survey of shield materials that can reflect neutrons back to the blanket and can also protect the outer vessel, coils, and people from neutrons and gamma rays. This survey continues being investigated.