**Figures and Sources**

Neutron Flux:

Thermal neutrons ejected from the fusion plasma are found to have an energy of 14.1 MeV, corresponding neutron flux is taken to be 1MWm-2 [1]

Nuclear cross sections:

Table 1

|  |  |  |
| --- | --- | --- |
| Isotope | Total Scattering cross section (b) | Absorption cross section (b) |
| Lithium-6 | 0.97 | 0.0386 |
| Lithium-7 | 1.4 | 0.0454 |
| Lead-204 | 12.3 | 0.661 |
| Lead-206 | 10.68 | 0.0266 |
| Lead-207 | 10.82 | 0.625 |
| Lead-208 | 11.34 | 0.230 |

Table 1: Contains data for the scattering and absorption cross section of each isotope in the blanket. Absorption data is for thermal neutrons [2][3[4].

Proportions and compositions:

The eutectic point of PbLi alloy has variable lithium content between 15-17%. Theoretical statistical methods and empirical methods have found lithium content at 15.7% and lead at 17% to be ideal; 0.62% and 99.38% respectively by weight [5].

Relative abundances of isotopes:

Table 2

|  |  |
| --- | --- |
| Isotope | Abundance (%) |
| Lithium-6 | 7.589 |
| Lithium-7 | 92.411 |
| Lead-204 | 1.4245 |
| Lead-206 | 24.1447 |
| Lead-207 | 22.0827 |
| Lead-208 | 52.3481 |

Table 2: Gives the natural abundances for each isotope within the blanket [2].

Number density:

References:

[1] Behrisch, R. et al (1998) Transmutation of plasma facing materials by the neutron flux in a DT fusion reactor.

[2] Mughabghab, S.F. (2003) Thermal neutron capture cross sections resonance integrals and g-factors. Upton, NY: Brookhaven National Laboratory, IAEA.

[3] L’Annunziata, M.F. (2008) Radioactivity: Introduction and history. Amsterdam etc: Elsevier.

[4] Sears, V.F. (1992) Neutron scattering lengths and cross sections. Neutron News, Volume 3.

[5] Garcinuño, B. et al (2022) Establishing technical specifications for PbLi eutectic alloy analysis and its relevance in fusion applications. Nuclear Materials and Energy: Elsevier.