Using deuterium to make solar generators

Abstract: This study sets out to determine which fusion power generator design is most suitable for centralised power production to be used commercially in communities comprising of domestic, ...

Deuterium and tritium are promising fuels for producing energy in future power plants based on fusion energy. Fusion energy powers the Sun and other stars through fusion. Deuterium and tritium are ...

Motivated by energy shortages and in view of current efforts to develop clean, renewable energy sources based on fusion, a solar-driven strategy has been developed for deuterium evolution.

The deuterium-tritium (D-T) neutron flux from a Thermo-FisherTM MP320 neutron generator was determined experimentally in this study. Fast neutron flux from a neutron generator can be measured ...

To create electricity from fusion using a D-³He fuel cycle, we must engineer a machine that can both operate with and abundantly generate fuels for sustained use.

Scientists explore nuclear fusion using light element isotopes, highlighting deuterium and tritium as the promising fuel for clean energy.

Under terrestrial conditions, this is best achieved with the two types of hydrogen: deuterium and tritium. Deuterium is called heavy hydrogen because its nucleus contains a neutron in addition to a proton. ...

Spin-polarized D-T fuel can increase tritium burn efficiency (TBE) by an order of magnitude or more without compromising output. TBE increases nonlinearly with decreasing tritium fraction, while power ...

Although different isotopes of light elements can be paired to achieve fusion, the deuterium-tritium (D-T) reaction has been identified as the most achievable and the most efficient.

This study opens a new avenue to discover promising photocatalytic deuterium generation systems for advanced solar energy utilization and deuterium enrichments.

OverviewSpin polarizationConceptDiscoveryReactant sourcingFusion reactorsSpin-polarized D-T fuel can increase tritium burn efficiency (TBE) by an order of magnitude or more without compromising output. TBE increases nonlinearly with decreasing tritium fraction, while power density increases roughly linearly with D-T cross section. In a 481 MW ARC-like tokamak with unpolarized 53:47 D-T fuel, the minimum tritium inventory was 0.69 kg. Spin-polarizing the fuel with a 63:37 D-T mix reduces the required tritium to 0.03 kg. With advanceme...

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