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# P4.130 Characterisation of JET ILW divertor plasma facing surface materials by temperature-QMS analysis

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Fusion fuel retention is a major issue for fusion devices. A set of divertor HFGC tile samples from first 2011-12 JET ITER-like wall (ILW-1) campaign were analysed in the research to complement the data obtained by other analysis methods [1].
Experiments were carried out using Hositrad MGT 6-300 Multi Gas Analyser with Thermal Desorption. The device operates with two Quadrupole Mass spectrometers (QMS) – high precision 1-6 amu detector (0.02 amu resolution) and 6-300 amu detector (0.1 amu resolution) with heating up to ~1470 K in vacuum (p ≈ 1•10^-6 mbar). Analysed samples were heated to 1273 K (~15 K•min-1 heating rate).
Investigation of plasma facing surface samples provides signals of relatively short (5-8 C) hydrocarbon CxHy fragments upon initial heating till ~600 K as evidence of thin organic films on the surface of divertor tile. Species of fusion fuel (D/D2/DT/T) were observed though release temperature and amount varies with samples. Initial T+ release peaks were observed at ~700 K, with secondary peaks at ~1000 K and ~1200 K.
Results were compared to tritium activity from full combustion experiments done previously and photo-stimulated luminescence (PLS) data [2] of the same samples. Though at present stage of the study obtained data cannot be fully quantified, amounts of species observed are corresponding to PLS results.
Overall, QMS analysis confirms the presence of fusion fuel components in the divertor material plasma facing surface similarly observed by other analysis methods.

[1] A.Widdowson et.al./ Nuclear Fusion 57 (2017) 086045
[2] Y.Hatano et.al./Journal of Nuclear Materials 463 (2015) 966–969

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