

Abstract Submitted
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Molecule formation in plasma at surface D.C. SCHRAM, J.H. VAN HELDEN, R.A.B. ZIJLMANS, G. YAGCI, Technische Universiteit Eindhoven, J. ROPCKE, S. WELZEL, Institut für Niedertemperatur Plasmaphysik, O. GABRIEL, R. ENGELN, Technische Universiteit Eindhoven, TU/e TEAM, INP TEAM — With diode laser spectroscopy and mass spectrometry the generation of new molecules is studied in two types of plasmas: an expanding thermal plasma at TU/e and a microwave discharge at INP. Molecules formed in argon plasmas with N, H, O and C containing molecules were measured in a two laboratory study. Flows, pressure and power were designed such that an appreciable portion of the admitted gases could be dissociated. The results are very similar: predominantly H_2 , N_2 , CO, H_2O and/or O_2 are formed and to a lesser extent, NO, HCN and NH_3 , C_nH_m and CO_2 . Also H_2CO is observed. Surface generation is concluded for most of the observed molecules. The surface is passivated with radicals from the plasma and the abundances of specific precursor adsorbants as H, N, OH, NH_2 , NO, CH_3 etc. is apparently important for the production of new molecules. Observation of excited species as $\text{H}_2(\text{r,v})$, N_2^* and NO_2 (shuttle glow) near to surfaces at high fluxes of radicals forms a further support for the surface production mechanism.

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