

## P2.3021 Diffusion coefficients of nickel hydride molecule in hydrogen

*Tuesday, 9 July 2019 14:00 (2 hours)*

See the full abstract here:

<http://ocs.ciemat.es/EPS2019ABS/pdf/P2.3021.pdf>

We present experimental investigations of the transport properties of NiH radical in molecular hydrogen gas. We use NiH to model the behaviour of the first row transition metal monohydrides (e.g. CrH, FeH, TiH) that are established markers for cool stellar atmospheres - i.e. M, L, T-type stars. The data presented here will contribute to various models needed to simulate processes in the stellar atmospheres and to calculate stellar opacities.

The hydride molecules are produced in a discharge source with coaxial geometry. It consists of a glass tube inside which are placed eight ring-shaped cathodes, made of thin sheet of Nickel metal, and an anode assembly which resides concentrically within the cathode rings. Operating the source in pulsed mode allows for a peak value of the discharge current of about 1 A to be achieved. The working pressure of the H<sub>2</sub> falls in the range 50 - 600 mTorr. The diffusion coefficient of NiH in hydrogen is determined by measuring the decay of the absorption in the time interval between 1 - 6 ms after the discharge has been extinguished. The experimental data are fit to a non-linear model [1] from which we extract information about the diffusion coefficients of NiH in H<sub>2</sub> and the coefficient of reflection from the source walls.

This work was supported by the National Science Fund of Bulgaria through project No. DN 18/12 2017 and by the Bulgarian National Science Program 2018 "Young Scientists and Postdoctoral Researchers".

References

[1] I. M. Rusinov, G. W. Paeva and A. B. Blagoev, J. Phys. D 30, 878-1884 (1997)

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**Session Classification:** Poster P2