SPECTROSCOPY OF THE PRODUCTS OF THE REACTIONS BETWEEN ABLATED TRANSITION METALS AND SMALL HYDROCARBONS

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The products of the reactions between ablated transition metals and small hydrocarbons have been investigated using laser induced fluorescence. In the low resolution (FWHM=0.05cm^{-1}) spectrum of the products of ablated Pt with C_3H_3 or CH_4 a series of weak features close to the $^1\Pi \leftarrow {}^1\Sigma^+$ band of PtC[a] have been identified. These features are broad and exhibit no reso lveable rotational structure. All the bands disappear when the C_3H_3 or CH_4 is replaced with NH_3, H_2 or CS_2. The dispersed fluorescence spectra of these bands displays a low frequencey progression ($\omega_e \approx 250\mathrm{cm}^{-1}$) close to that observed in Pt_2, however, they are not Pt_2[b,c]. On this basis, these features are tentatively assigned to Pt_2CH_x. Progress on the analysis of these bands, higher resolution work and new work on Fe and other transition metals with small hydrocarbons will be presented.

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[c] S. Taylor, G. W. Lemire, Y. M. Hamrick, Z. Fu and M. D. Morse, *J. Chem. Phys.*, **89**, 5517, (1988)