LASER EXCITATION AND DISPERSED FLUORESCENCE SPECTRA OF PtC_2

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The laser excitation spectrum of molecules produced in a molecular beam formed by laser ablation of a platinum rod in the presence of a methane/argon mixture in a supersonic free-jet expansion has been recorded. A series of bands observed at 18200, 18440 and 18660 cm^{-1} is attributed to PtC_2. The molecule is proposed to have a T-shaped structure with C_2v symmetry, analogous to YC_2 [a]. The dispersed fluorescence spectra observed by pumping the bands show progressions in both ν_2 (a_1, Pt-(C_2) *st.*) and ν_3 (b_2, Pt-(C_2) *rock*) in addition to several bands involving combinations of these modes. Preliminary analysis has yielded frequencies $\nu_2'' = 485$ cm^{-1} and $\nu_3'' = 223$ cm^{-1}. Isotopic substitution spectra have also been recorded using carbon-13 substituted methane in the carbon source. A discussion of the vibrational analysis will be given.

[a] T. C. Steimle, A. J. Marr, J. Xin, A. J. Merer, K. Athanassenas and D. Gillett, J. Chem. Phys. **106**, 2060-2066 (1997)