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Isotropic Rayleigh Light Scattering in Two-component Systems. The Interdependence of the Concentration and the Density Scattering

Yoshinobu SHIOKAWA and Shin SUZUKI

Bull. Chem. Soc. Japan, **48** (1975), 171.

The isotropic Rayleigh ratios in two-component systems are discussed in terms of the fluctuation of the thermodynamic quantities. It is found that the isotropic Rayleigh ratio, R_{is}, is the sum of the concentration scattering, R_c, due to flucutation of the concentration and the so-called density scattering, R_d:

$$R_{is} = R_c + R_d$$

Thus, the cross-term of the concentration scattering and the density scattering, suggested by Bullough, is not included in the above expression. Our conclusion is confirmed by the determination of the molecular weight of sucrose.

Crystal Structure of Vanadium Suboxide $V_2O_{1\pm x}$

Kenji HIRAGA and Makoto HIRABAYASHI

J. Solid State Chem., **14** (1975), 219.

A monoclinic structure with the unit cell content $2V_7O_3$ and its derivative structure designated as V_7O_{3+x} have been determined by X-ray and electron diffraction study. In both the structures, the oxygen atoms occupy regularly special octahedral interstitial sites in the body-centered monoclinic (or pseudo-tetragonal) metal lattice with the axial ratio $c/a \approx 1.2$. The ordered distribution of the oxygen atoms is interpreted from the condition of minimization of the elastic strain in the vanadium lattice.

Interstitial Superstructures in the Ta-D System

H. ASANO, Y. ISHINO, R. YAMADA and M. HIRABAYASHI

J. Solid State Chem., **15** (1975), 45.

Ordered deuterium arrangements and order-disorder transformations of the tantalum deuterides in the range $TaD_{0.50}$-$TaD_{0.78}$ have been studied by neutron diffraction and calorimetry at temperatures between −170 and 120°C. In addition to the disordered phase (α), three ordered phases based on the superstructures $Ta_2D_{1+x}(\beta_1)$, $Ta_4D_3(\gamma)$, and $TaD(\delta)$ are clarified. The Ta_2D_{1+x} structure is a nonstoichiometric form of the Ta_2D superstructure over the range $x<0.5$. The γ-phase is formed below −70°C near Ta_4D_3, and transforms into the β_1 and δ-phases, respectively, in the hypo and hyperstoichiometric compositions. The δ-phase that exists beyond $TaD_{0.75}$ changes to the disordered α-phase around 100°C.