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| Titolo                  | Raman spectroscopic study of high temperature rare earth metal - rare earth halide solutions: Ln-LnX <sub>3</sub> - and LnX <sub>2</sub> -LnX <sub>3</sub> -(LiX-KX) <sub>eu</sub> systems (Ln: Nd, Ce; X: Cl, I) [online]  |
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| Sommario/riassunto      | <p>In this work new Raman spectroscopic experiments on rare earth metal-rare earth trihalide melts (Ln-LnX<sub>3</sub> and LnX<sub>2</sub>-LnX<sub>3</sub>: Ln=Ce, Nd; X=Cl, I) and their mixtures in alkali halide eutectic solvents ((LiX-KX)<sub>eu</sub>; X=Cl, I) are presented. The main results can be summarized as follows:</p> <ul style="list-style-type: none"> <li>- The Raman spectra of following trihalide systems have been measured for the first time: CeCl<sub>3</sub>, CeI<sub>3</sub>, NdI<sub>3</sub> and their mixtures in the respective alkali halide eutectic solvent. The structure of the LnX<sub>3</sub> in the solvent can be characterized by octahedral complexes. The force constants decrease from the chlorides to the iodides.</li> <li>- The Raman spectra of the following dihalides have been observed in this work: NdCl<sub>2</sub>, CeI<sub>2</sub> and their mixtures in the alkali halide solvent. Interestingly, CeCl<sub>2</sub> might form as intermediate species on doping CeCl<sub>3</sub> with Ce. It is not a stable compound in the Ce-CeCl<sub>3</sub> phase diagram.</li> </ul> <p>With respect to the above mentioned main objective the following conclusions can be drawn: (i) On mixing of NdCl<sub>2</sub> with NdCl<sub>3</sub> in (LiCl-KCl)<sub>eu</sub> the undisturbed spectra of both components can be observed simultaneously. This is in agreement with the suggested intervalence charge transfer hopping mechanism if one assumes a hopping rate below 10<sup>12</sup>.(ii) Even though CeCl<sub>2</sub> might form as intermediate, in the equilibrium spectra of liquid Ce-CeCl<sub>3</sub>-(LiCl-KCl)<sub>eu</sub> only the typical - 36 CeCl -octahedra can be identified. This supports the assumption that in these systems the electronic defect</p> |

states are probably mobile Drude-like electrons which do not lead to new Raman detectable species. A qualitatively similar observation was made for CeI2-CeI3-(Li-K)eu melts.

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