

四元体系MCl-GdCl₃-HCl-H₂O(M=K, Rb, Cs; 20℃)的研究

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摘要 本文研究了四元体系MCl-GdCl₃-HCl-H₂O(M=K, Rb, Cs; 20℃)在不同酸浓度下的溶度,绘制了相应的溶度图,当M=K, HCl wt%=14~23%的平行截面时,体系中无化合物形成;当M=Rb, HCl wt%=13%时,体系中无化合物形成,但在HCl wt%=22的平行截面时,体系中形成固液异组成的化合物RbCl₃GdCl₃·3.4H₂O(1);当M=Cs, 在HCl wt%分别为13%和20%的条件下,体系均形成4CsCl₃GdCl₃·3H₂O(2)和2CsCl₃GdCl₃·3.7H₂O(3)两种化合物, 2在两种酸浓度下都是固液异组成的化合物, 3随酸浓度由低到高的变化,从固液同组成化合物转变为固液异组成化合物。化合物1, 2未见文献报道。本文的研究结果为Meyer的合成反应提供了热力学相平衡基础和新的机理解释,并可以更好地应用和指导Meyer合成反应。同时,首次提出了合成RbGd₂Cl₇、Cs₃Gd₂Cl₉两个化合物的可能性。

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A study on quaternary systems MCl-GdCl₃-HCl-H₂O(M=K, Rb, Cs; 20℃)

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Abstract The solubilities of saturated solns. of quaternary systems: MCl-GdCl₃-HCl-H₂O (M = K, Rb, Cs; 20℃) at different acid concns. have been determine and the corresponding equilibrium diagrams were constructed. When M = K, at the parallel sections of HCl%(wt) = 14 - 23, no compounds were formed in the system; when M = Rb, at HCl%(wt) = 13, no new phases were discovered, but at the parallel section of HCl%(wt) = 22 the incongruently soluble compound RbCl₃GdCl₃·3.4H₂O (I) was formed; when M = Cs, at HCl%(wt) = 13 and 20 of saturated solns., two typical compounds 4CsCl₃GdCl₃·3H₂O (II) and 2CsCl₃GdCl₃·3.7H₂O (III) were formed. The compound II is incongruently soluble compound at the two acid concns. With increasing acid concentration, the transition of compound III from congruently soluble to incongruently soluble occurs. The compounds I, II and III have been also characterized by X-ray diffraction and thermoanal. The compounds I and II have not yet been reported in the literature.

Key words [PHASE EQUILIBRIUM](#) [WATER](#) [HYDROCHLORIC ACID](#) [QUATERNARY SYSTEM](#) [POTASSIUM CHLORIDE](#) [CESIUM CHLORIDE](#) [RUBIDIUM CHLORIDE](#) [GADOLINIUM CHLORIDE](#)

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