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吸附与润湿**II.Triton X-100**和**Triton x-305**在炭黑/水和炭黑/环己烷界面上的吸附层结构

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摘要 测定了15℃和30℃时炭黑自水和环己烷中吸附非离子型表面活性剂TritonX-100和Triton X-305的等温线;计算了吸附过程的标准热力学函数;测定了石墨/水/环己烷和石墨/水/空气的接触角与表面活性剂浓度的关系,分析所得结果,可得结论:在炭黑/水或石墨/水界面上,Triton型表面活性分子形成单分子吸附层,分子以憎水的iso-C8H17C6H4基团附着在表面,而以亲水的聚氧乙烯链伸入水相的方式取向;在炭黑/环已烷或石墨/环已烷界面上,分子是通过聚氧乙烯链吸附到表面上的,当浓度增加时分子在表面可能通过聚氧乙烯链间的相互作用而发生聚集,即可能形成表面反式胶团。

关键词 水 吸附 浓度 表面化学 炭黑 炭黑 非离子表面活性剂 环己烷 石墨 表面分析 吸附层理论 润湿 ＴＲＩＴＯＮ Ｘ-１００ ＴＲＩＴＯＮ Ｘ-３０５

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Adsorption and wetting II. Adsorption of triton X-100 and triton-305 onto carbon black from water and cyclohexane solutions

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Abstract The adsorption isotherms of nonionic surfactants Triton X-100 and Triton X-305 onto carbon black from water and cyclohexane solns. were measured at 15?and 30? A Langmuir type isotherm from water solution and a BET type isotherm from cyclohexane solution were obtained; the standard changes of free energy (DG0), enthalpy (DH0) and entropy (DS0) in adsorption processes were calculated A pos. value of DS0 from water solution and a neg. value of DS0 from cyclohexane solution were obtained. The contact angles of water for the systems graphite/water/air and graphite/water/cyclohexane as functions of surfactant concentration were measured. The contact angle of water on graphite always decreases monotonously with increasing surfactant concentration From these results it is concluded that the adsorption of Triton type nonionic surfactants at carbon black/water and graphite/water interfaces is monolayer, and the mols. heading their hydrophobic group (iso-C8H17C6H4) attachs the carbon black surface and the polyethylene glycol chain towards the polar medium, i.e., water. A model is proposed to explain the adsorption of Triton-type nonionic surfactants at carbon black/cyclohexane and graphite/cyclohexane interfaces, with their S-type isotherms.

Key words WATER ADSORPTION CONCENTRATION SURFACE CHEMISTRY CARBON BLACK CARBON BLACK NON IONIC SURFACTANTS CYCLOHEXANE GRAPHITE SURFACE ANALYSIS ADSORBED LAYER THEORY WETTING TRITON X-100 TRITON X-305

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