

Topological quasi-hydrogen, topological-quasi-positronium, and the skyrmion-like soliton on hydrogen-adsorbed Ni(111) surface and in graphite intercalation compounds

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Investigation of hydrogen-surface interaction is of significance for catalytic reactions such as hydrocarbon reactions and hydrogen chemisorption on metal surfaces. Okuyama et al.[1,2] have presented that delocalized states of atomic hydrogen are formed on Ni(111), by means of electron energy loss spectroscopy. Kanazawa and coworkers[3,4] have studied positron annihilation spectra and reemitted slow positron from hydrogen-adsorbed Ni(111) surface. They have discussed the disordered state of adsorbed hydrogens on Ni(111) surface and have suggested the presence of the positronium hydride PsH[5] on hydrogen saturately adsorbed Ni(111) surface. In addition, by using “topological quasi-hydrogen” model, they have suggested that the hydrogen state in C₈RbH_x might have the Kondo-like property[6] and the effect of positron energy loss in alkali metal graphite intercalation compounds has been discussed[7]. In this study[8], we will propose the new description of chemisorbed hydrogen and one factor of catalysis mechanism by using “topological quasi-hydrogen” model.

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