CHEMICAL REVIEWS

Review

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Reactivity of Surface Species in Heterogeneous Catalysts Probed by In Situ X-ray Absorption Techniques

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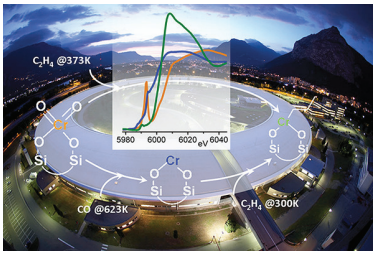

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1. INTRODUCTION

Starting from the late seventies, the progressively increased availability of synchrotron light sources allowed the execution of experiments requiring a high X-ray flux in a continuous interval.[1−6] Among them, X-ray absorption spectroscopy (XAS, also known as X-ray absorption fine-structure, XAFS),[7−12] in both near (XANES) and post (EXAFS) edge regions, has become a powerful characterization technique in all the fields of materials science,[12−35] and in particular in catalysis.[13,16,22,23,25,30,31,36−40] After a slow start in the 1980s, mainly because of the difficulties in performing in situ experiments at the synchrotrons, the progressive development of more sophisticated and better performing experimental set-ups that allow the catalyst's state to be monitored under reactive

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