Oxidation of Alkenes with Chromylchloride

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The mechanisms for the oxidation of alkenes by compounds like OsO_4, $KMnO_4$ or CrO_2Cl_2 have been discussed under the light of a proposed [2+2] intermediate. It could be concluded that reaction via the [3+2] intermediate is prefered for OsO_4 and $KMnO_4$. But the oxidation by CrO_2Cl_2 produces a wide variety of products like chlorohydrines, epoxides and aldehydes/ketones. These products are difficult to explain by the addition of the alkene to the oxygen moiety of CrO_2Cl_2. Therefore new computational results (B3LYP/6-31G*) for a competing mechanism are presented, which can explain the different products formed.