It has now been found that, surprisingly, in the preparation of acrolein by catalytic gas phase oxidation of propylene with molecular oxygen, it is possible to employ propylene gas of lower quality without significantly worsening the performance characteristics of the oxidation catalyst used compared to the use of high-quality propylene. It was expected that the yield of acrolein would decline over a prolonged period of operation in the case of use of sulphur components, since side reactions can be enabled by the sulphur compound in the reaction system, or the catalyst is poisoned and selectivity for acrolein thus decreases. More particularly, it has been found that the propylene used, or a propylene-containing reaction gas, may contain sulphur and/or unsaturated hydrocarbons without any significant deterioration in the conversion of propylene and the yield of acrolein compared to the use of propylene without the impurities mentioned.

In addition, refinery grade propylene (75.48% by weight of propylene, 24.04% by weight of propane, 0.28% by weight of ethane, remainder saturated and unsaturated C2 to C5 hydrocarbons (excluding C_3 and ethane), 0.7 mg/kg of sulphur, water content below 20 mg/kg) was used as a feed gas for the partial oxidation in the presence of molecular oxygen over a mixed oxide catalyst as described in DE 10 2006 015710 A1. Analogously to the experiments with sulphur component, no significant influence on catalyst performance was found.

The propane present in refinery grade propylene can also be used advantageously firstly as an ~~inter~~inert gas (under the conditions described above), and secondly as a fuel gas in a thermal post-combustion connected downstream of the process, which in turn allows a