

Abstract**5 C-4-based process for preparing MMA with return and recycling of methacrolein**

The present invention describes an improved process based on C-4 raw materials for producing methacrylates, in particular for preparing methacrylic acid and methyl methacrylate (MMA). The C4 raw materials in this case are in particular isobutene or tert-butyl alcohol. In addition, a wide range of embodiments for the efficient preparation of these products are presented.

10 The present invention relates in particular to a process for preparing methacrylic acid and methyl methacrylate by gas-phase oxidation of isobutene. In a second gas-phase oxidation step, methacrolein is converted to methacrylic acid and unconverted methacrolein is removed from methacrylic acid. This methacrolein is evaporated in an evaporation apparatus in the presence of
15 various gases and steam and is mixed in gaseous form together with the process gas of the first oxidation stage in which methacrolein is prepared. In this way, the recycled methacrolein can be resupplied to the process and to the catalytic partial oxidation.

Fig. 1