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CONTINUOUS PREPARATION OF ALKYL ESTERS  
OF (METH)ACRYLIC ACID  
Abstract

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In a process and an apparatus for the continuous preparation of alkyl esters of (meth)acrylic acid by reacting (meth)acrylic acid with alkanols having from 1 to 5 carbon atoms in a homogeneous, liquid, solvent-free phase at elevated temperature and in the presence of an acid esterification catalyst, in which the (meth)acrylic acid, the alkanol and the catalyst are fed to a reaction zone, the water formed is removed by rectification during a residence time as constituent of a mixture comprising alkanol in a rectification unit superposed on the reaction zone, the distillate thus obtained is separated into an organic phase comprising alkanol and an aqueous phase comprising water, the organic phase is returned to the rectification unit, the reaction mixture is discharged from the reaction zone and conveyed into a distillative separation zone comprising further rectification units and in the latter the alkyl (meth)acrylate formed is separated off. Therein, a) (meth)acrylic acid and an alkanol are reacted in a molar ratio of from 1:0.75 to 1:2, b) the organic phase formed in the rectification unit (III) is essentially completely returned to the rectification unit III, c) the total amount of the aqueous phase formed in the rectification unit III is essentially removed from the system, d) the reaction mixture discharged from the reaction zone is, with addition of water, fed to a further rectification unit (I) and in this is separated into a product (II) comprising the catalyst and the remaining (meth)acrylic acid and a product (I), comprising the alkyl ester of (meth)acrylic acid, remaining alkanol and water, e) the product (II) formed in the

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rectification unit (I) is essentially completely returned to the reaction zone,  
f) the product (I) from the rectification unit (I) is separated into an  
organic phase comprising the alkyl ester of (meth)acrylic acid and an  
aqueous phase and g) the organic phase formed in the rectification unit  
5 (I) is fed to a further rectification unit (II) and in this the alkyl ester of  
(meth)acrylic acid is separated from the remaining alkanol and the  
remaining alkanol is returned to the reaction zone.

Figure 1