



## Reactive coalescent agents having fungicidal effects

### Current situation

Polymer dispersions are used as binders in water-borne coatings. The properties of these polymer dispersions depend on the glass transition temperature ( $T_g$ ) of the polymer. A relatively hard or at least a non-tacky surface is often a desirable coatings property. To attain such properties, the glass transition temperature of the polymer should typically be rather high, or the polymer should be cross-linked. Because coalescence of a polymer is dependent on the glass transition temperature, too, coalescent agents are generally added to latex paints for film forming at low or moderate temperatures.

Coalescent agents are often organic solvents that evaporate to the environment as the paint dries and cures, thus causing odour, occupational safety and pollution problems. Accordingly, traditional coalescing agents contribute to the increase of volatile organic compounds (VOC) in the environment and to total emissions from paints, which are also restricted by legislation.

An object for the development of coalescent agents is to introduce on the market substitutes therefore not belonging to VOC component class. However, a drawback of several widely used non-volatile or slowly evaporating components is their inherent plasticizing property causing slow build-up of the paint film hardness, and accordingly, the paint film may even remain soft.

### Invention

Objects of the invention are to provide novel aliphatic epoxides containing polar groups, preferably ether or ester groups, their use in coating compositions as coalescent agents and/or as reactive diluents and as fungicides and to provide a method for their production. Also the invention provides a method for accelerating the curing of coating compositions.



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### Solution benefits

Problems of the known solutions of prior art may be eliminated or at least substantially reduced by the procedure of the invention. Aliphatic epoxides containing a large hydrocarbon residue, including linear aliphatic, branched aliphatic and cycloaliphatic epoxide ethers and epoxide esters, provide excellent coalescent properties, and further, they may readily be dispersed in water and solvents, the solubility thereof in binder polymers present in the coating being good and they act well as reactive diluents. This is due to particularly suitable molecular sizes, the presence of polar groups, and high boiling points (above 200 °C).

Such compounds may totally or partly be substituted for present coalescent agents, particularly for reactive coalescent agents and reactive diluents in coating compositions. Curing of coating film may be significantly accelerated using these agents. Aliphatic and cycloaliphatic epoxide derivatives may be used for producing various compositions like aqueous or solvent-based dispersions containing binders, which are in the case of latex paints polyvinyl acetates, polyacrylates, and copolymers thereof.

Also alkyd resins may be used as binders.

The aliphatic epoxide compounds of the invention may be used in coating compositions including paint, paper coatings, varnish, joint mortar, filler mortar, mortar, ink and adhesive compositions. The aliphatic epoxides according to the invention can also act as efficient reactive diluents in coating compositions and moreover, several of the compounds also have fungicidal effects.

### Application areas

- Manufacturers of binders and resins
- Producers of paints, inks and adhesives and their end-users

### Patent publications:

WO 2005/090501 A1 "Reactive Coalescent Agents"  
WO 2005/089549 A1 "Use of Epoxides as Fungicides"

### Additional information

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### Microscopic images - Effect of coalescing agent on filming.

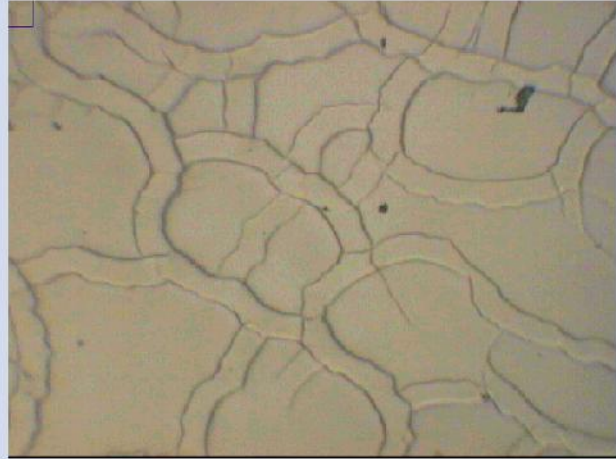


Image: dispersion 1, 40 x objective  
(1,65 x 1,37 mm)



Image: 6 weight % of MLa 43 and dispersion 1, 40 x objective (1,65 x 1,37 mm)