

ALIEN PROPERTY CUSTODIAN

CONDENSATION PRODUCTS AND PROCESS OF PREPARING THEM

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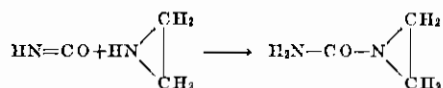
The present invention relates to a process of preparing condensation products and to the products thus obtained.

It is known to manufacture condensation products containing nitrogen by causing aliphatic isocyanic acid esters to react with alkylene imines, especially with ethylene imine.

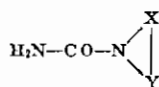
N'-alkyl-N.H-ethylene

ureas are thus formed.

Now I have found that water-soluble condensation products containing nitrogen are easily obtained in a very pure form by causing an alpha.beta-alkylene imine, especially ethylene imine to act upon isocyanic acid or an agent yielding isocyanic acid. The reaction occurs, for instance with respect to ethylene imine, according to the following formula:



The condensation products thus obtained are N,N-alkylene ureas of the general formula:



wherein



stand for an alkylene radical bound to the nitrogen atom in alpha.beta-position. Alpha.beta-alkylene imines are, besides ethylene imine, for instance, propylene imine, butylene imine, alpha.beta-decylene imine or other compounds. Products are thus obtained in which the cyclically

bound CH₂-CH₂ group may be substituted by aliphatic hydrocarbon radicals. The reaction which takes place with considerable evolution of heat is advantageously carried out in a solvent or a diluent. The said products are obtained in a well crystallized form and possess in the monomeric state an unlimited stability. From the N'-alkyl-N,N-alkylene ureas, obtained from the isocyanic acid esters and alkylene imines, they are distinguished by the fact that they possess an unsubstituted amino group, which renders further reactions possible, for instance the reaction with formaldehyde.

The compounds of the invention, especially N,N-ethylene urea, are suitable for various purposes of application. They may, for instance, be used as intermediate products or as valuable assistants in the textile, lacquer and rubber industry or the like.

The following example serves to illustrate the invention, but it is not intended to limit it thereto, the parts being by weight:

A solution of 43 parts of ethylene imine (boiling at 54° C-56° C under a pressure of 760 mm) in 50 parts of ether is run into a solution of 43 parts of isocyanic acid in 400 parts of ether, while stirring and well cooling. The temperature should not exceed 0° C. The N,N-ethylene urea formed during the reaction separates in a crystallized form and with a good yield. By recrystallization from acetone it is obtained in well-defined crystals and has in this form an unlimited stability. It is very readily soluble in water, soluble in alcohol and acetone and sparingly soluble in ether, benzene, benzene and carbon tetrachloride. It melts at 108° C.

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