

[0019] In relation to the present invention the following may also be noted with reference to the example in which, according to the invention, melamine and/or urea, sulphite and formaldehyde are used. An even distribution of sulphite and formaldehyde will be produced over the melamine molecule, which itself is again condensed further to form a polymer composed of sulphonated melamine units. If a portion of the melamine is replaced by urea during the sulphonating phase, in the process according to the invention, this will hydrolyse below a pH of 7.0 and lose almost half of its molar mass, with the result that a large portion of the economic advantage of the use of urea is lost. This hydrolysis will not take place if urea is incorporated during the second phase.

[0020] In the process according to the invention, a polymer is probably formed which has more than one sulphite group, joined to the nucleus by unsulphonated amine and/or urea molecules, on the outside of the molecule cluster.

[0021] The resins prepared by the process of the invention can be sulphonated and condensed at relatively high temperatures, for example at 95 - 110°C. As a result, the polycondensation can even take place at a pH above pH 7.0, with the result that appreciably lesser amounts of salts are produced after adjusting to a pH of 10.5 at the end of the preparation.

[0022] In addition to the technological advantages relating to the temperature sensitivity, the process according to the invention also has economic advantages because, in the process, high percentages of relatively cheap ingredients such as urea and sulphite can be used.

[0023] The invention also relates to products, optionally in dried form, which are obtainable or have been obtained by the process described above.

[0024] The invention relates to the use of such products as additives or ingredients for hydraulically hardening systems, in particular concrete and anhydride, also in combination with, for example, lignin, naphthalenes, surfactants, accelerators and retarders or directly as auxiliary material.

[0025] The invention is explained in greater detail in the examples below.

Example 1

[0026] In the first phase, the ingredients are loaded into a standard reactor provided with stirrer, automatic pH control (by dispensing acid and alkali), heating system and cooling system in the following ratio: 1 mol of melamine, 7 mol of formaldehyde/1 mol of sulphite and water with a theoretical solids content of 75%.

[0027] The pH is automatically adjusted to 12.2 and heating is furthermore carried out to 103°C. After the free sulphite no longer decreases, the pH is again adjusted in the second phase to 7.3 and 15 mol% of melamine is added to the mixture and condensation is carried out until the product has a viscosity of approximately 100 cP.

Example 2

[0028] In the first phase, ingredients are added to the abovementioned reactor in a molar ratio which is currently standard for the manufacture of this type of products: melamine, formaldehyde, sulphite 1:3:1, with the exception that only 75% of the melamine is added.

[0029] Sufficient water is added for the theoretical solids content to be 38%. The mixture is heated to 75°C while stirring and the pH is adjusted to 10.5. After a decrease in the free sulphite can no longer be observed, the remainder of the melamine is added in the second phase, the mixture is cooled to 50°C and the pH is adjusted to 6 and condensation is carried out until the product has a viscosity of 90 cP.

Example 3

[0030] 1 mol of melamine, 1 mol of sulphite and 3 mol of formaldehyde and an amount of water is added to a standard reactor so that a product having a solids content of 40% is produced and heating is carried out to 78°C. The pH is adjusted to 11 with NaOH. After free sulphite is no longer detected, the pH is adjusted to 5.5 and the temperature to 55°C. After the correct viscosity has been reached, the pH is again adjusted to between 10 and 11 and the mixture is cooled to 25°C.

Example 4

[0031] According to Example 3, in which the urea is added after no decrease in the amount of free sulphite is observed: