

solution was formed during this procedure, while heating gently, and was stirred at 41° C. for one hour, poured into 1 l of water and acidified with half-concentrated sulphuric acid.

After the solid which had precipitated had been separated off, the methylene chloride phase was extracted with water, dried and concentrated to give 314.70 g (53% of theory) of a beige-coloured solid of a mixture of the para- and meta-isomers (X) and (XI) of pyromellitic acid di(N-tert.-butyl-N-methacryloyloxyethylamide). A purified white solid was obtained by taking up the resulting product in aqueous sodium carbonate solution, extracting the mixture with methylene chloride and precipitating the product again with half-concentrated sulphuric acid.

Melting point: 121° C.

IR(KBr):  $\nu=3400-2500, 1715, 1618, 1411, 1405, 1360, 1330, 1300, 1213, 1172, 1131, 955, 780 \text{ cm}^{-1}$ .

$^1\text{H-NMR}$  ( $\text{CDCl}_3$ , 200 MHz):  $\delta=1.57$  (s, 18 H,  $\text{C}(\text{CH}_3)_3$ ), 1.86 (bs, 6 H,  $=\text{CCH}_3$ ), 3.45 (m, 4 H,  $\text{NCH}_2$ ), 4.12 (m, 4 H,  $\text{OCH}_2$ ), 5.53, 5.98 (2 m, in each case 2 H, vinylidene H), 7.89 (bs, 2 H,  $\text{COOH}$ ), 8.41 (s, 2H, aromatic H) ppm.

FAB-MS (glycerol-DMF):  $m/z=$   
589 ( $[\text{M}+\text{H}]^+$ )  
587 ( $[\text{M}-\text{H}]^-$ ).

#### EXAMPLE 4

Pyromellitic acid (N-tert.-butyl-N-methacryloyloxyethylamide) (XII)

A solution of 185.27 g (1.000 mol) of N-tert.-butyl-2-aminoethyl methacrylate in 250 ml of xylene was added to a mixture of 218.12 g (1.000 mol) of pyromellitic acid dianhydride, 171.50 g (1.200 mol) of triethylamine and 2200 ml of xylene at room temperature, while stirring, and the mixture was heated at 50° C. for one hour. The mixture was filtered, the filtrate was poured into ice-water and, for hydrolysis, the mixture was acidified with half-concentrated sulphuric acid and stirred for 30 minutes. The precipitate which had separated out was filtered off with suction and recrystallised from ethyl acetate to give 232.05 g (about 55% of theory) of a white solid which, in addition to the pyromellitic acid (N-tert.-butyl-N-methacryloyloxyethylamide) (XII), contained a relatively small amount of the double reaction products (X) and (XI) of Example 3.

Melting point: 215° C.

IR (KBr):  $\nu=3500-2500, 1710, 1605, 1400, 1345, 1316, 1282, 1194, 1153, 932, 752 \text{ cm}^{-1}$ .

$^1\text{H-NMR}$  ( $d_6\text{-DMSO}$ , 200 MHz):  $\delta=1.49$  (s, 9H,  $\text{C}(\text{CH}_3)_3$ ), 1.78 (bs= $\text{C-CH}_3$ ), 3.44 (m, 2 H,  $\text{NCH}_2$ ), 4.06 (m, 2 H,  $\text{OCH}_2$ ), 5.61, 5.89 (2 m, in each case 1 H, vinylidene H), 7.62, 8.29 (2 s, in each case 1 H, aromatic H), 8.40 (bs, 3 H,  $\text{COOH}$ ) ppm.

FAB-MS (glycerol-DMF):  $m/z=$   
422 ( $[\text{M}+\text{H}]^+$ ),  
420 ( $[\text{M}-\text{H}]^-$ ).

#### EXAMPLE 5

Benzene-1,3-dicarboxylic acid-4(carboxylic acid N-tert.-butyl-N-methacryloyloxyethylamide) (XIII) Benzene-1,4-dicarboxylic acid-5(carboxylic acid N-tert.-butyl-N-methacryloyloxyethylamide) (XIV)

A solution of 185.27 g (1.000 mol) of N-tert.-butyl-2-aminoethyl methacrylate in 250 ml of methylene chloride was added dropwise to a mixture of 192.13 g (1.000 mol) of benzenetricarboxylic acid anhydride, 500 ml of dry methylene chloride and 303.57 g (3.000 mol) of dry

triethylamine at room temperature, while stirring. After the mixture had been stirred at 41° C. for 4 hours, it was poured into 3 l of water, the mixture was acidified with half-concentrated sulphuric acid and the organic phase was separated off. The aqueous phase was extracted with methylene chloride and, after drying and stabilisation with 350 mg of 2,6-di-tert.-butylcresol, the combined organic phases were concentrated to give 284.60 g (78% of theory) of a beige-coloured solid of a mixture of the two isomers (XIII) and (XIV) of benzenetricarboxylic acid mono-(N-tert.-butyl-N-methacryloyloxyethylamide).

Melting point: 71° C.

IR (KBr):  $\nu=3400-2400, 1700, 1610, 1370, 1283, 1161, 1040, 1010, 932, 752 \text{ cm}^{-1}$ .

$^1\text{H-NMR}$  ( $\text{CDCl}_3$ , 200 MHz): for XIII: 1.58 (bs, 9 H,  $\text{C}(\text{CH}_3)_3$ ), 1.82 (bs, 3 H,  $=\text{CCH}_3$ ), 3.32 (m, 2 H,  $\text{NCH}_2$ ), 4.51 (m, 2 H,  $\text{OCH}_2$ ), 5.49, 5.95 (2 m, in each case 1 H, vinylidene H), 7.1 (m, 2 H,  $\text{COOH}$ ), 8.15, 8.75 (m, 3 H, aromatic H) ppm.

for XIV:  $\delta=1.43$  (s, 9 H,  $\text{C}(\text{CH}_3)_3$ ), 1.8 (bs, 3 H,  $=\text{CCH}_3$ ), 3.48 (m, 2 H,  $\text{NCH}_2$ ), 4.1 (m, 2 H,  $\text{OCH}_2$ ), 5.44, 6.03 (2 m, in each case 1 H, vinylidene H), 7.1 (m, 2 H,  $\text{COOH}$ ), 8.0-8.6 (m, 3 H, aromatic H) ppm.

#### EXAMPLES 6 to 10

Preparation of the formulations for use as an adhesive

The adhesives according to the invention are produced by intensive mixing of the constituents listed in the following examples.

#### EXAMPLE 6

37.5 g of water  
50.0 g of tetrahydrofuran  
12.5 g of trimellitic acid N-tert.-butyl-N-methacryloyloxyethylamide (IX) according to Example 2  
0.02 g of camphorquinone

#### EXAMPLE 7

27.3 g of water  
63.6 g of tetrahydrofuran  
9.1 g of trimellitic acid N-tert.-butyl-N-methacryloyloxyethylamide anhydride (VIII) according to Example 1  
0.02 g of camphorquinone

#### EXAMPLE 8

40.0 g of water  
48.0 g of tetrahydrofuran  
8.4 g of trimellitic acid N-tert.-butyl-N-methacryloyloxyethylamide (IX) according to Example 2  
3.6 g of trimellitic acid N-tert.-butyl-N-methacryloyloxyethylamide anhydride (VIII) according to Example 1  
0.02 g of camphorquinone

#### EXAMPLE 9

93.7 g of ethanol  
6.3 g of pyromellitic acid di(N-tert.-butyl-N-methacryloyloxyethylamide (p- and m-isomers (X) and (XI) according to Example 3)  
0.01 g of camphorquinone

#### EXAMPLE 10

43.5 g of water  
43.5 g of tetrahydrofuran (oxyloxyethylamide) (XII) according to Example 4