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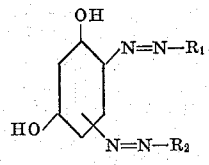
DISAZO DYESTUFFS SOLUBLE IN WATER

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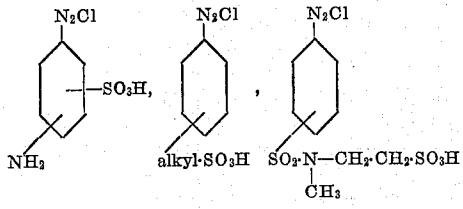
4 Claims. (Cl. 260—184)

The present invention relates to disazo-dyestuffs soluble in water; more particularly it relates to dyestuffs of the following general formula:



wherein R_1 and R_2 stand for radicals of the benzene series, at least one of the radicals containing a free amino-group and/or at least one alkyl-SO_3H group, and wherein the dyestuff contains at least two sulfonic acid groups.

We have found that valuable disazo-dyestuffs soluble in water are obtainable by coupling in any order of succession 1,3-dihydroxybenzene with 1 molecular proportion of a diazo-compound of the benzene series and 1 molecular proportion of a diazo-compound from a base of the benzene series containing besides the amino-group to be diazotized a free amino-group and/or at least one alkyl-SO_3H group, the components being selected in such a manner that the finished dyestuff contains at least two sulfonic acid groups. Dyestuffs of this kind are, for instance, obtained by coupling a diazo-compound of the following constitution:

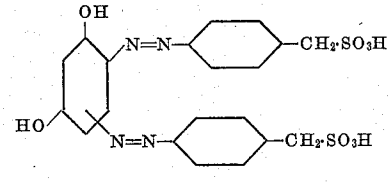


with 1,3-dihydroxybenzene and combining the monoazo-dyestuff thus obtained with any diazo-compound to form the disazo-dyestuff. The sequence of coupling may also be reversed. It is, of course, also possible to combine 2 molecular proportions of the diazo-compound substituted by amino and/or alkyl-SO_3H groups with 1 molecular proportion of 1,3-dihydroxybenzene. The components are always selected in such a manner that the finished disazo-dyestuff contains at least two sulfonic acid groups which may be in each of the radicals of the two diazo-components or both in the radical of one diazo-component.

The dyestuffs thus obtained have good fastness properties and are particularly adapted for dyeing leather.

The following examples serve to illustrate the invention, but they are not intended to limit it thereto; the parts are by weight, unless otherwise stated, and the relationship of parts by weight to parts by volume is that of the kilo to the liter:—

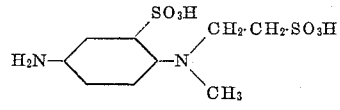
(1) 37.4 parts of 4-amino-1-benzylsulfonic acid (molecular weight 187) are dissolved in 350 parts of water with the calculated quantity of sodium carbonate, whereby the acid is transformed into the sodium salt. This solution is mixed with 50 parts by volume of hydrochloric acid of 20° Bé. and diazotized at 0° C. with 13.8 parts of sodium nitrite. The diazo-solution obtained is run gradually at 0° C., while stirring, into an aqueous solution of 11 parts of 1,3-dihydroxybenzene (molecular weight 110) in the presence of an excess of sodium carbonate. After coupling is complete the dyestuff formed is salted out, filtered with suction and dried. It is a dark-brown powder which dissolves in water to a brown solution and is suitable, for instance, for dyeing chrome-tanned calf. The dyestuff corresponds with the following formula:



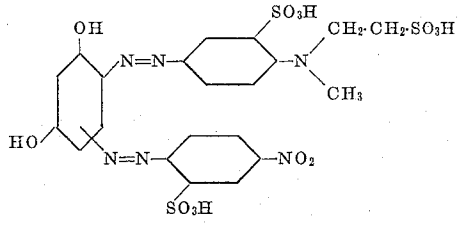
Chrome-tanned calf is neutralized in known manner, well rinsed and dyed at 60° C. for 1 hour with 3 per cent. of the above dyestuff. After addition of formic acid, the dyed leather is greased in a fresh bath and finished in the usual manner. It is well dyed in the grain a medium reddish-brown tint and may be well buffed without changing its tint.

(2) An aqueous solution of the diazo-compound prepared in the usual manner from 31.2

parts of 4-amino-benzene-1-methyltaurine-2-sulfonic acid (molecular weight 312) of the following constitution:



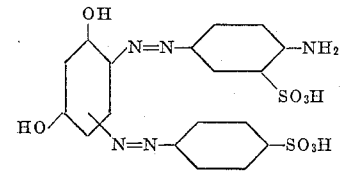
is run at 0° C., while stirring, into an aqueous solution of 11 parts of 1,3-dihydroxybenzene (molecular weight 110) in the presence of sodium carbonate. After coupling is complete there is gradually added to the dyestuff formed a suspension of the diazo-compound from 21.8 parts of 4-nitro-1-aminobenzene-2-sulfonic acid (molecular weight 218). In a medium alkaline with sodium carbonate the formation of the disazo-dyestuff is finished very quickly. The dyestuff is salted out, isolated and dried. It is a black-brown powder which dissolves in water to a reddish light-brown solution. The dyestuff has the following formula:



East Indian kips are dyed, after drumming, with 100 grams of the dyestuff for 1 dozen kips. After 50 minutes' drumming, 50 grams of formic acid of 85 per cent. strength are added to the bath. A reddish light-brown leather is obtained which is finished in the usual manner. After drying, it may be buffed and used for velvet effects.

(3) An aqueous solution of about 20 per cent. strength of 30.9 parts of 1,4-diaminobenzene-sulfomethyltauride is diazotized, after addition of 15 parts by volume of crude hydrochloric acid, with 6.9 parts of sodium nitrite at 0° C. to 10° C. The diazo-solution is gradually run, while stirring, into an aqueous solution of 11 parts of 1,3-dihydroxybenzene in the presence of 12.3 parts of sodium acetate. In order to complete the coupling, which proceeds slowly, the equivalent quantity of sodium carbonate solution is run in. After coupling is finished the mono-azo-dyestuff thus obtained is combined in a medium alkaline with sodium carbonate with a suspension of the diazo-compound prepared from 21.8 parts of 2-nitro-1-aminobenzene-4-sulfonic acid. This coupling operation to produce the diazo-dyestuff is advantageously conducted in the presence of sodium chloride. The dyestuff is filtered with suction and dried. It is a brown powder and dyes leather well in the grain a yellow-brown tint.

(4) 18.8 parts of 1,4-diaminobenzenesulfonic acid are dissolved in the equivalent amount of dilute caustic soda solution, mixed rapidly in the presence of a small quantity of ice with 25 parts by volume of crude hydrochloric acid and then directly diazotized with a solution of 6.9 parts of sodium nitrite. The filtered diazo-solution is then run into 11 parts of 1,3-dihydroxy-benzene in the presence of a solution of 21 parts of sodium acetate in a small amount of water. The monoazo-dyestuff formed is combined in the presence of sodium carbonate with a suspension of the diazo-compound prepared in the usual manner from 17.3 parts of sulfanilic acid. The dyestuff is salted out with sodium chloride, filtered with suction and dried. It is a brown powder which dyes leather in the grain reddish-brown tints. The dyestuff is characterized by the following formula:



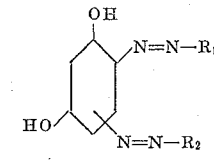
By substituting in the foregoing example 18.8 parts of 1,4-diaminobenzenesulfonic acid for the 17.3 parts of sulfanilic acid a dyestuff of similar properties is obtained.

(5) An aqueous solution of 30.2 parts of the sodium salt of 1-aminobenzene-3-sulfotauride is diazotized, after addition of 25 parts by volume of crude hydrochloric acid, with 6.9 parts of sodium nitrite at 0° C. to 10° C. The diazo-solution is then gradually run into a slightly mineral-acid, aqueous solution of 11 parts of 1,3-dihydroxybenzene. The coupling is finished by gradually introducing 15 parts of sodium carbonate dissolved in a small quantity of water. The mono-azo-dyestuff is then transformed into the disazo-dyestuff in a manner analogous to that described in Example 4, by means of diazotized sulfanilic acid. When this second coupling is finished, the solution is neutralized with hydrochloric acid and evaporated to dryness. A brown powder is obtained which dyes leather well in the grain yellow-brown tints by the above described methods.

(6) A valuable leather dyestuff of similar properties is obtained by substituting in Example 3 sulfanilic acid for the 2-nitro-1-aminobenzene-4-sulfonic acid.

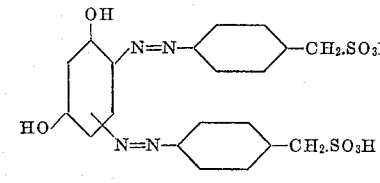
We claim:

1. The disazo-dyestuffs of the following general formula:



wherein R_1 and R_2 stand for radicals of the benzene series, at least one of the radicals containing an alkyl-SO_3H group, and wherein the dyestuff contains at least two sulfonic acid groups, being brown powders, soluble in water, penetrating deeply into the leather and yielding yellow-brown to red-brown shades.

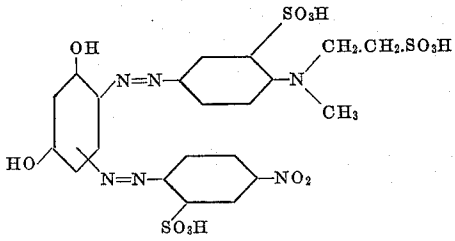
2. The disazo-dyestuff of the following formula:



being a dark-brown powder, soluble in water to

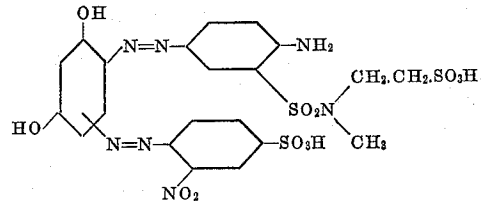
a brown solution, penetrating deeply into the leather and yielding reddish-brown shades.

3. The disazo-dyestuff of the following formula:



being a black-brown powder, soluble in water to a reddish light-brown solution, penetrating deeply into the leather and yielding reddish light-brown shades.

4. The disazo-dyestuff of the following formula:



being a brown powder, soluble in water, penetrating deeply into the leather and yielding yellow-brown shades.

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