One goal that has been pursued for a long time is to efficiently and inexpensively produce homogeneous coatings in an immersion process in order to produce thicker coatings that are essentially smooth and as closed as possible.

The object of the present invention is therefore to propose a method by which a paint formulation can be deposited easily and homogeneously on metallic surfaces with good coverage using a liquid system, which is also rinse-resistant, if necessary. Therefore, the object was also to propose the simplest possible method for accomplishing this.

Summary of Invention

In a first aspect, the present invention refers to a method for coating metallic surfaces of substrates comprising the steps or consisting of the steps:

I. Preparing a substrate with a cleaned metallic surface,

II. Contacting and coating metallic surfaces with an aqueous composition in the form of a dispersion and/or suspension,

VI. Optionally rinsing the organic coating and

VII. Drying and/or baking the organic coating or

VIII. Optionally drying the organic coating and coating with a similar or additional coating composition before drying and/or baking,

characterized in that in step II the coating is applied with an aqueous composition in the form of dispersion and suspension, wherein at least one anionic polyelectrolyte in an amount of 0.01 to 5.0 wt%, based on the total mass of the resulting mixture, is added to a dispersion of film-forming polymers and/or a suspension of film-forming inorganic particles with a solids content of 2 to 40 wt% and an average particle size of 10 to 1000 nm, wherein the aqueous composition has a pH value in the range of 4 to 11 and forms a coating based on an ionogenic gel which binds cations dissolved out of the metallic surface, these cations originating from a pretreatment stage and/or from contacting in step II.

In a second aspect, the present invention refers to an aqueous composition containing an anionic polyelectrolyte in an amount of 0.01 to 5.0 wt%, based on the total mass of the resulting mixture, in a dispersion of film-forming polymers and/or a suspension of film-forming inorganic

particles with a solids content of 2 to 40 wt% and an average particle size of 10 to 1000 nm, wherein the aqueous composition has a pH value in the range of 4 to 11.

In a further aspect, the present invention refers to the use of the method of the present invention for coating substrates which have posed problems in coating with an electrodip paint.

Detailed description

~~This~~The object of the present invention is achieved with a method for coating metallic surfaces of substrates, comprising or consisting of the steps:

I. supplying a substrate having a cleaned metallic surface,
II. contacting and coating metallic surfaces with an aqueous composition in the form of a dispersion and/or suspension,
III. optionally rinsing the organic coating and
IV. drying and/or baking the organic coating or
V. optionally drying the organic coating and also coating with a similar or additional coating composition before drying and/or baking,

such that in step II, the coating is performed using an aqueous composition in the form of a dispersion and/or suspension, wherein at least one anionic polyelectrolyte is added in an amount of 0.01 to 5.0 wt%, based on the total mass of the resulting mixture, to a dispersion of film-forming polymers and/or a suspension of film-forming inorganic particles with a solids content of 2 to 40 wt% and an average particle size of 10 to 1000 nm, such that the aqueous composition has a pH value in the range of 4 to 11 and forms a coating based on an ionogenic gel, which binds cations dissolved out of the metallic surface, so that these cations originate from a pretreatment stage and/or from contacting in step II.