

# UNITED STATES PATENT OFFICE.

FRIEDRICH LUDWIG SCHMIDT, OF CHARLOTTENBURG, GERMANY, ASSIGNOR TO THE ROESSLER & HASSLACHER CHEMICAL COMPANY, A CORPORATION OF NEW YORK.

MIXTURE OF BORATES CONTAINING ACTIVE OXYGEN.

1,155,103.

Specification of Letters Patent.

Patented Sept. 28, 1915.

No Drawing. Original application filed January 25, 1910, Serial No. 540,044. Divided and this application filed May 7, 1914. Serial No. 836,889.

*To all whom it may concern:*

Be it known that I, FRIEDRICH LUDWIG SCHMIDT, a citizen of the German Empire, residing in Charlottenburg, Germany, have  
5 invented certain new and useful Improvements in Mixtures of Borates Containing Active Oxygen, of which the following is a specification.

Sodium perborate possesses the property  
10 of giving off its oxygen rather rapidly in water at a temperature as low as 50° C. This is a disadvantage in the application of sodium perborate as a bleaching agent, inasmuch as the washing and bleaching  
15 process can only properly begin at a higher temperature, so that a large proportion of the oxygen will be driven off and its effect lost before the efficient temperature is attained. In view of this fact, the discovery  
20 that magnesium perborate evolves its oxygen at a higher temperature represented an advance.

It is known that mixtures of sodium perborate and a magnesium salt in equivalent  
25 proportions can be employed for bleaching, instead of pure magnesium perborate. In this case the magnesium perborate is formed from the sodium perborate and the magnesium salt by double decomposition.  
30 The proportions which are used in the latter process are such that the whole of the sodium perborate is decomposed by the magnesium salt. To this extent the latter process differs from that with magnesium  
35 perborate in the fact that the magnesium perborate is produced by the said double decomposition just before the bleaching occurs.

While the employment of magnesium  
40 perborate for bleaching purposes represents an advance as regards the bleaching effect, owing to the greater stability of the magnesium perborate under boiling, yet, on the other hand, its high price and some other  
45 shortcomings militate against its wide employment.

I have found that it is possible to obtain the effect of greater resistance to boiling with the cheap sodium perborate and with  
50 other alkali metal perborates containing active oxygen, by adding certain substances

to the same. These substances include the salts of magnesium, and their base, magnesia itself.

The process so far as it extends to the  
55 addition of magnesium, differs from the above-mentioned process according to which sodium perborate is completely decomposed by equivalent proportions of magnesium salt.  
60

It is not necessary to add to the alkali metal perborate so much magnesium compound that the whole bleaching process is carried out with magnesium perborate, that is to say, that all the sodium perborate is  
65 decomposed by the magnesium salt. On the contrary, it is possible to attain the said effect of greater resistance to boiling with only very small proportions of an addition of a magnesium compound. The addition  
70 of a fraction of a molecular proportion suffices to attain a very distinct effect. This action of less than equivalent proportions of magnesium salt was not to be foreseen, for in the process the greater portion of  
75 the sodium perborate remains unaltered in solution, and the natural assumption would therefore be that this unaltered sodium perborate would split off the oxygen as readily as do ordinary solutions of sodium per-  
80 borate.

The process utilizing only small quantities of magnesium salt is of special advantage on account of its technical advantage over the process using either ready  
85 prepared magnesium perborate or freshly formed magnesium perborate. Both magnesium perborate and the magnesium borate into which the former becomes converted after the bleaching action are insoluble.  
90 There is therefore in the bleaching liquor a considerable quantity of such magnesium precipitate, which, owing to the large quantity present, has a detrimental effect and is difficult to remove from the bleached goods.  
95 By using smaller quantities of magnesium salt, less of this troublesome precipitate has to be dealt with, and the less the quantity of magnesium salt used the smaller is the quantity of the precipitate.  
100

The new mixtures above described are claimed in a separate application filed by



me, January 20th, 1910, under Serial Number 540,044, of which this application is a division.

I have further found that not only magnesium possesses the described action, but the same action is also possessed by the soluble compounds of zinc such as zinc chlorid, or its equivalent. It is well known that zinc chlorid in solutions is readily ionized. The addition of one-fifteenth of a molecular proportion of chlorid of zinc is found to make the solution stable so that the percentage of oxygen remaining after heating is much greater than when the zinc chlorid is not present.

The stabilizing effect of the soluble compounds of zinc applies not only to sodium perborate, but also to the other borates containing active oxygen, which can be obtained by crystallization or by mixing or melting. It applies also to perborax and such borates containing active oxygen, as manufactured by the process covered by Letters Patent of the United States issued to me, October 24th, 1911, under No. 1,006,798. The effect obtained also applies to mixtures

of the borates containing active oxygen with other substances having a similar action. The said stabilizing substances may be added to the active borates and the mixture of both of them, ready for use, may be placed upon the market, or the procedure may be such that they are added just before use or during use.

It is not necessary that the salts or bases having an action in the described sense shall be of the ordinary kind; for example, the per-salts and peroxids of the same will serve the purpose.

I claim:

A bleaching mixture, comprising a perborate and a soluble inorganic compound of zinc in less than an equivalent molecular proportion, and having a superior bleaching effect.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

FRIEDRICH LUDWIG SCHMIDT.

Witnesses:

WOLDEMAR HAUPT,  
HENRY HASPER.