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PROCESS FOR OBTAINING PHENOLS FROM PHENOL-BEARING INDUSTRIAL LIQUORS

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According to the processes hitherto known the washing of phenol-bearing industrial liquors including ammoniacal liquor for the purpose of removing phenol therefrom is effected exclusively by means of benzene or its homologues. This process has the great disadvantage that it does not make it possible to obtain the whole of the phenols of the ammoniacal liquor and in particular the valuable water-soluble carbolic acid. Many experiments carried out on the basis of this process have yielded the result that on an average only about 65 per cent of the phenols present in the ammoniacal liquor can be recovered economically, while the remaining 35 per cent consisting mainly of carbolic acid is to be abandoned.

According to the present invention the above mentioned objection is removed by adding to the extraction media hitherto employed tar bases viz., bases of coke-plant tar or of low-temperature distillation tar, such as pyridine, quinoline or their homologues, the boiling point of which is preferably so high that the solubility in water of this class of substances is no longer in evidence. The greater cleansing action which is obtained with such a basic gas-washing oil, readily admits of being explained by the chemical affinity of the bases for the acid phenols. Accordingly the actual washing action in this process is to be attributed to the bases themselves, while benzene and its homologues are to be regarded as solvents or diluents for these substances and may therefore be replaced by petrol or other neutral oils.

Comparative experiments based on the processes hitherto usual and the process forming the subject matter of the present invention have given the following results:

Example I

(*a*) 2 litres of ammoniacal liquor having a phenol content of 4.7 grams per litre are washed once with 40 per cent. (800 cubic centimetres) of 90-degree benzene at 10° C. The phenol yield amounts to 53 per cent.

(*b*) Similarly 2 litres of the same ammonical liquor are treated once with 800 cubic centimeters of a washing medium consisting of 90-degree benzene and 10 per cent. bases (boiling point from 200 to 250° C.). The yield of phenol amounts in this case to 82 per cent of the whole quantity of phenols in the ammonical liquor. The increased yield of phenol as compared with experiment (*a*) is therefore about 50 per cent. Losses of bases could not be determined.

Example II

2 litres of the same ammoniacal liquor are washed twice with a 20 per cent. quantity (that is, 2×400 cubic centimetres) of washing oil consisting of 90-degree benzene with 20 per cent. of bases boiling at 230° C. From the liquor so treated no perceptible quantities of phenols can be obtained by subsequent extraction with ether. The yield is therefore to be regarded as practically quantitative.

In the case of a similarly arranged experiment with 90-degree benzene as washing medium, only a yield of about 65 per cent could be obtained.

Example III

500 cubic centimetres of a crude ammoniacal liquor with 3.19 grams of phenols per litre are washed three times with 200 cubic centimetres of a tar oil from which phenol has been removed and which has a boiling point of from 200 to 250° C. in which 4 per cent of bases as such are contained, which here come into action in a free state. In this way 82 per cent of the phenols could be recovered.

Example IV

500 cubic centimetres of an ammoniacal liquor which as before contains 3.19 grams of phenols per litre is washed three times, each time with 100 cubic centimetres of bases, which have been obtained from tar oil having a boiling point of from 240° C. to 320° C. About 75 per cent of the phenols could be extracted.

What I claim is:—

1. A process for obtaining phenols from phenol-bearing industrial liquors, compris-

ing treating the said liquors with tar bases.

2. A process for obtaining phenols from phenol-bearing industrial liquors, comprising treating said liquors with bases from coke-plant tar.

3. A process for obtaining phenols from phenol bearing industrial liquors, comprising treating said liquors with tar oils from which the phenols have been removed but which still contain bases.

4. A process for obtaining phenols from phenol bearing industrial liquors, comprising treating the said liquors with a mixture of aromatic hydrocarbons and tar bases.

5. A process for obtaining phenols from phenol-bearing industrial liquors, comprising treating the said liquors with a mixture of aromatic hydrocarbons and bases from coke plant tar.

In testimony whereof I affix my signature.

DOCTOR FRITZ ULRICH.