

THE DISTRIBUTION COEFFICIENT OF FOETIDINE

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Among the known methods for the isolation of foetidine [1], the ion-exchange method has proved to be economically rational for industrial production [2, 3]. One of the stages of this method is liquid extraction. We have studied the process of the distribution of foetidine in the eluate-organic solvent system.

For the complete exhaustion of the eluate, seven contacts of the phases are required, with a ratio of eluate and organic solvent of 3:1 in each contact.

In the first three contacts of the phases, about 90% of the desired product is obtained, and in the remaining contacts, in addition to the combined alkaloids, a large amount of foreign substances is extracted the elimination of which is associated with great losses of foetidine. Consequently it would be desirable to extract three times.

Table 1 gives information on the extraction of foetidine by organic solvents and mixtures of them in the eluate-organic solvent system at definite values of the pH of the eluate. The amount of foetidine was 0.07% of the total weight of the raw material.

Thus, it has been shown that the distribution coefficient of foetidine in the organic solvents studied is fairly high; with an increase in the pH of the eluate the distribution coefficient falls, which is explained by the formation of an emulsion and the incomplete separation of the phases. A good solvent for the extraction of foetidine from the eluate proved to be gasoline-chloroform (4:1).

TABLE 1. Distribution Coefficients of Foetidine in Organic Solvents as Functions of the pH

Solvent	Alkaloids, % wt. of raw material	Foetidine, % alkaloids	K_p	Alkaloids, % wt. of raw material	Foetidine, % alkaloids	K_p
	pH 8			pH 10		
Benzene	0,133	31,2	2,7	0,106	38	2,5
Gasoline		Very small	amount isolated			
Chloroform	0,108	33	1,8	0,106	36	2,1
Dichloroethane	0,15	28,5	3,3	0,095	42,1	2,5
Gasoline - chloro- form (4:1)	0,135	33	3,7	0,085	50	3,1
Gasoline - chloro- form (2:1)	0,102	40,8	2,9	0,104	41	3,2
Gasoline - benzene	0,125	31,8	2,5	0,073	54	2,3
Gasoline - benzene (1:1)	0,141	30,3	3,1	0,085	47,4	2,5
Gasoline - benzene (1:2)						
Gasoline - dichloro- ethane (4:1)	0,119	36	3,3	0,085	50	3,1
Dichloroethane - benzene (1:4)	0,128	31	2,4	0,09	42,5	2,1
Dichloroethane - chloro- form (2:1)	0,175	24	3	0,175	23	2,5

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