QUANTITATIVE DETERMINATION OF AFLATOXINS IN COTTONSEED MEAL AND PROTEINS

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It is known that old fungi of the species Aspergillus flavus produce mycotoxins distinguished by a high toxicity and, in a number of cases, possessing mutagenic, teratogenic, and carcinogenic properties [1].

The aim of the present investigations was to detect aflatoxins B_1, B_2, G_1, and G_2 in the products of the processing of cottonseed meal and to determine them quantitatively.

The weight of the sample for the determination of the aflatoxins was 100 g. The aflatoxins were extracted by aqueous acetone, and then the extract was evaporated to dryness in a rotary evaporator and the residue was dissolved in chloroform. The aflatoxins were determined quantitatively according to standard recommendations [2] using two-dimensional TLC for purifying and separating the combined aflatoxins.

The aflatoxins were determined in samples of meals received from the Kokand and Tashkent oils and fats combines from 1981 to 1984 and also in protein isolates obtained from the same meals in the Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR.

TABLE 1. Quantitative Levels of Aflatoxins in Cottonseed Meals and the Isolated Protein

Producer	Year of production	Levels of aflatoxins, μm/kg			
		B_1	B_2	G_1	G_2
Meal					
Kokand Oils and Fats Combine	1981	3,60	0,40	—	—
	1982	0,33	0,33	0 50	0,50
	1983	0,56	0,56	0,50	0,50
	1984	0,14	0,14	0,07	0,07
Tashkent Oils and Fats Combine	1982	6,05	—	—	—
	1983	1,45	1 45	1,25	1,25
	1984	1,60	1,60	0,80	0,80
Protein from meals 1—4					
Institute of the Chemistry of Plant Substances	1981	1,75	1,75	—	—
	1982	0,70	0,70	—	—
	1983	0,25	0,25	0,12	0,12
	1984	0,22	0,22	0 30	0 30

The results, which are given in Table 1, show a contamination with aflatoxins of the cottonseed meal and of the protein obtained from it. The levels of aflatoxins did not exceed the maximum acceptable concentration laid down for afltoxin B_1, which is 5 μg/kg for all good products.

LITERATURE CITED

1. "Hygienic criteria of the state of the environment for mycotoxins," in: Mycotoxins, WHO, Geneva (1982), p. 12.

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 6, pp. 843-844, November-December, 1985. Original article submitted July 9, 1985.

 0009-3130/85/2106-0808$09.50

2. Methodological Recommendation for the Detection, Identification, and Determnation of Aflatoxins in Food Products [in Russian], Moscow (1981).

O-ALKYL S-CHLOROFORMYL DITHIOCARBONATES FOR PEPTIDE SYNTHESIS

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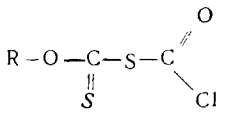
In order to study the condensing properties of compounds of the O-alkyl S-chloroformyl dithiocarbonate series and their subsequent use in the synthesis of peptides, we have performed the synthesis of O-ethyl and O-butyl S-chloroformyl dithiocarbonates with the general formula



(R—C_2H_5, —C_4H_9).

The O-ethyl and O-butyl S-chloroformyl dithiocarbonates were obtained by the reaction of the corresponding potassium O-alkyl dithiocarbonates with phosgene in absolute ether, benzene, or carbon tetrachloride at −10-5°C with vigorous stirring and the subsequent raising of the temperature of the reaction mixture to room temperature. The O-alkyl S-chloroformyl dithiocarbonates obtained were yellow liquids with a specific odor readily soluble in organic solvents but insoluble in water.

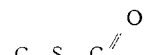
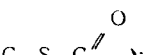
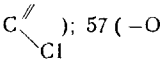
The structures of the compounds that we had obtained were confirmed by mass and IR spectroscopy and refractometry. The mass spectrum of O-butyl S-chloroformyl dithiocarbonate contained strong peaks of the following fragments: *m/z* 212 (*m*+); 177 (—Cl); 149 (— ); 117 (— ); 57 (— ); 43 (—CH_2— ); 29(—CH_2—CH_2— ).

TABLE 1. Compounds Synthesized with the Aid of S-(Butoxythiocarbonyl)chlorothioformate and Their Main Constants

Compound	Yield %	mp, °C found	mp, °C lit.	$[\alpha]_D^{20}$, deg	R_f in system* 1	R_f in system* 2
Benzyloxycarbonyl-Gly-pentachlorophenyl	71,4	126—128	128—130 [3]		0,77	0,80
Benzyloxycarbonyl-Ala-pentachlorophenyl	86,7	100—102	100—104 [4]		0,92	0,94
Benxyloxycarbonyl-Gly-para-nitrophenyl	50,5	125—127	126—128 [5]		0,74	0,91
Benxvloxycarbonyl-Gly-Gly-OOH	65,4	62—65	64—66 [6]		0,89	0,92
Benzyloxycarbonyl-Ala-Gly-OOH	61,4	73—76	74—76 [6]	—19,1 (*c* 6; $CHCl_3$)	0,83	0,89
o-NPS-Ser-Gly(γ-benzyl)-2,4,5-trichlorophenyl	67,0	amorph.	Oil —[7]	—22,55 (*c* 4; ethyl acetate	0,92	0,90

*Systems: 1) butan-1-ol—water—acetic acid (4:1:1); 2) butan-1-ol—water—acetic acid—pyridine (30:24;6:20).

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