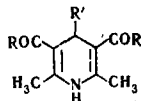


# 1,4-DIHYDROPYRIDINES AS INHIBITORS OF FREE-RADICAL REACTIONS

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UDC 547.822.1

It is known [1, 2] that several 1,4-dihydropyridines (I) have hydrogen-donor properties. We have studied the behavior of I as inhibitors of free-radical reactions. We used the autooxidation of linetol [3] both in the pure state and as an emulsion in a phosphate buffer (pH 6.0) at 40°C for 6 h. The level of per-



oxidation was determined by means of iodometric titration (peroxide number) and also by reaction with 2-thiobarbituric acid (TBA) [4]. The inhibiting or antioxidant activity of I was expressed in percent of the reduction of the autooxidation. The results (the average values of 9 to 15 experiments) are presented in Table 1.

Using the electrochemiluminescence method, we also investigated I as inhibitors of free-radical reactions [5]. The results (average values of three to five experiments), expressed in percent decrease in the initial level of chemiluminescence ( $J_{Cl}$ ), are correlated in Table 2.

The results demonstrate that the investigated I inhibit the studied free-radical processes to the same extent as ionol and  $NADH_2$ .

TABLE 1. Antioxidant Activity of 1,4-Dihydropyridines I ( $R' = H$ ) in Linetol

R	Linetol emulsion, $5 \cdot 10^{-4} M$ ( $5 \cdot 10^{-4} M$ of I)		Linetol, $10^{-3} M$ of I			
	without catalyst	$FeSO_4$ catalysis, $5 \cdot 10^{-4} M$	without catalyst		$CuSO_4$ catalysis, $10^{-4} M$	
	inhibition, %					
	with respect to TBA	with respect to TBA	with respect to peroxide No.	with respect to TBA	with respect to peroxide No.	with respect to TBA
$C_2H_5O$	57	57	72	41	60	41
$CH_3$	84	56	53	79	18	16
Ionol	57	77	100	100	97	40

TABLE 2. Inhibition of the Electrochemiluminescence by 1,4-Dihydropyridines (I)

R	R'	Inhibition, % ( $7.7 \cdot 10^{-7} M$ of I)	Concn. of I that reduces $J_{Cl}$ by 50%, M
$C_2H_5O$	$COONa$	20	$4 \cdot 10^{-5}$
$CH_3$	$COONa$	14	$2 \cdot 10^{-5}$
$CH_3$	H	15	—
$CH_3$	$CH_3$	14	$8 \cdot 10^{-6}$
$NADH_2$ Na-Salt		18	—

Institute of Organic Synthesis, Academy of Sciences of the Latvian SSR, Riga. Translated from *Khimiya Geterotsiklicheskih Soedinenii*, No. 1, pp. 133-134, January, 1972. Original article submitted April 14, 1971.

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We feel that a new class of antioxidants and free-radical-reaction inhibitors - 1,4-dihydropyridines - has been discovered.

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