CORROSION OF THE BUILDING' S STEEL IN THE WATER-ALCOHOL ENVIRONTMENT

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The transport of an alcohol by to tankers demands the detailed study of their corrosion activity as regards to the structure of the metal materials. The literature date of this problem is rather limited.

The re suit s of the investigations of the corrosion stability of the steel of the trade-mark ST 20, 12H1MF and 16TNM in the methil alcohol, athanol and izopropil alcohol as a function of the different temperature are sown in this paper. The type of the alcohol was choose corresponds to the real condition of the transport of the fill cargo.

The samples were prepared by the different technology methods.

Method I. The preliminary washing out by the fresh water without of the next drying. The maintenance of the water in the liquid which was investigated was smaller 0.1 %. There were in view of the real conditions of the transport of the cargo and the taking into consideration of the tanks perspire because the diversity of the temperature of the sea water and the cargo temperature.

Method 2. The washing out by the fresh water with the next drying.

Method 3. The washing out by the sea water without of the next drying.

Method 4. The washing out by the sea-water with the next drying.

The samples which were degreased and sinked in the liquid were subjected to the corrosion investigation. The corrosion firmness was fix determined by the changed of the samples mass. The condition of the surface was evaluated visual and by the atom-absorption spectroscopy method. The middle speed of the corrosion or corrosion mass coefficient was calculated by the decrease mass of the metal. The profundity corrosion coefficient and the mark and the group of the metal carrosion stability. The most favorable ways of the preliminary work of the steels.

Table 1. Results of the testing reported in table

Corrosive characteristics	Technological schema of processing				
	0	1	2	3	4
			Steel ST-20		
K 10^4; g\m^{2}h	4,3 / 6,1	122,7 / 12,1	10,3 / 9,7	196,1 / 33,2	20 / 17,4
P;mm\y	$7\cdot10^{-4}$ / $8\cdot10^{-4}$	$1,5\cdot10^{-2}$ / $1,6\cdot10^{-3}$	$1,4\cdot10^{-3}$ / $0,4\cdot10^{-3}$	$2,3\cdot10^{-2}$ / $5,0\cdot10^{-3}$	$1,5\cdot10^{-3}$ / $2,2\cdot10^{-3}$
Grade of stability	1\1	3\2	2\2	3\2	2\2
Stability group	AS / AS	S / ES	ES / ES	ES / S	ES / ES
			Steel 12H 1MF		
K 10^4; g\m^{2}h	2,2 / 5,3	116,1 / 12,0	10,2 / 9,1	510,2 / 486,1	19,3 / 44,2
P; mm\y	$1,1\cdot10^{-4}$ / $1,0\cdot10^{-4}$	$1,2\cdot10^{-2}$ / $1,3\cdot10^{-2}$	$1,2\cdot10^{-3}$ / $1,1\cdot10^{-3}$	$2,2\cdot10^{-2}$ / $3,0\cdot10^{-2}$	$3,0\cdot10^{-3}$ / $2,9\cdot10^{-3}$
Grade of stability	2\2	3\2	2\2	5\3	2\2
Stability group	ES / ES	S / ES	ES / ES	S / S	ES / ES
			Steel 16 TNM		
K 10^4; g\m^{2}h	1,2 / 4,6	110,0 / 8,6	9,1 / 8,3	480,1 / 396,0	18,7 / 39,2
P; mm\y	$1,0\cdot10^{-4}$ / $0,9\cdot10^{-4}$	$1,0\cdot10^{-2}$ / $1,2\cdot10^{-2}$	$1,0\cdot10^{-3}$ / $1,1\cdot10^{-3}$	$2,0\cdot10^{-2}$ / $1,8\cdot10^{-2}$	$2,7\cdot10^{-3}$ / $2,8\cdot10^{-3}$
Grade of stability			2\2	2\2	
Stability group	AS / AS	S / S	ES / ES	S / S	ES / ES

K – Corrosion rate; P -Corrosion depth index; S – Stable; ES – Extremely stable; AS – Absolutely stable;

Numerator – methyl alcohol; Denominator – isopropyl alcohol.