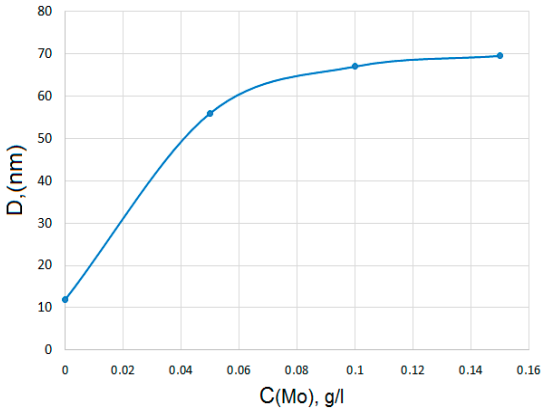

Figure 6. Dependence of the thickness of oxide-zirconium coatings on the concentration of Mo (VI) in the deposition solution.

As seen in Figure 6, with an increase in the concentration of Mo (VI) to 0.05 g/L in the deposition solution for oxide-zirconium coatings, a significant increase in the thickness of the formed coatings was observed. Thus, at a Mo (VI) concentration of 0.05 g/L, the thickness of the coating was 58.01 nm. With a further increase in the concentration of Mo (VI), the thickness of the coatings increased slightly: at 0.1 g/L, the thickness was 64.72 nm, and at 0.15 g/L it was 68.33 nm.

A study of the protective ability of the formed coating using Akimov's method with deposition time was carried out (Figure 7).

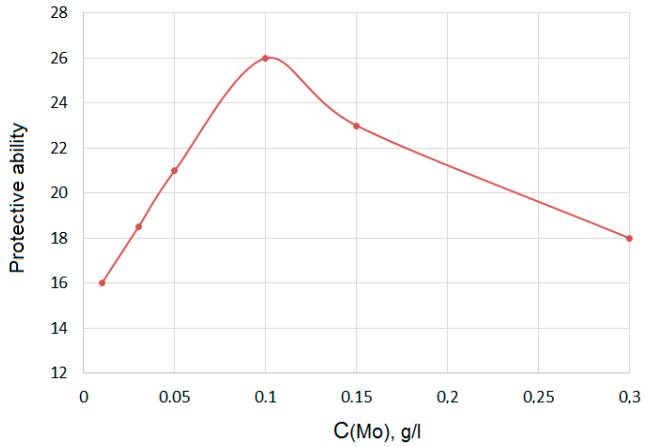

Figure 7. Dependence of the protective ability of oxide-zirconium coatings on the concentration of Mo (VI) in the deposition solution.

According to Figure 7, the protective ability of the oxide-zirconium coating increased significantly with an increase in the concentration of Mo (VI) to 0.1 g/L. With a further increase in the Mo (VI) concentration in the deposition solution, the protective ability of the coating was reduced. Therefore, the optimal composition of the solution for the deposition of the oxide-zirconium coating was: 0.2 g/L Zr (IV) + 0.15 g/L W (VI) + 0.1 g/L Mo (VI).

An important factor characterizing the possibility of using the obtained coatings is their adhesion strength, which is determined by the strength of the coating adhesion to the steel base. To quantify the bond strength, the normal peel method (fungal method) was used. The dependence of the adhesive strength of the oxide-zirconium coating on the deposition temperature from a solution of 0.2 g/L Zr (IV) + 0.15 g/L W (VI) + 0.1 g/L Mo (VI) is shown in Figure 8.