

**TITAN QOTISHMALARIGA PLAZMA-ELEKTROLITIK OKSIDLANISH  
USULI BILAN QOPLAMA OLIISH UCHUN  
NAMUNLAR TAYYORLASH**

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**Annotatsiya:** Plazma-elektrolitik oksidlanish usulida elektr razryadlari metall oksidi asosida hosil bo'lgan eritma komponentlari, elektrolitik cho'kma, shu jumladan ularning termoliz mahsulotlari va yuqori haroratli o'zaro ta'sirlarning qatlamlariga kiritilishi uchun sharoit yaratadi. Usulning xususiyatlariga asoslanib, tsirkonyum birikmalari bilan valf metallarida oksid qatlamlarini hosil qilishning bir necha yondashuvlari taklif etiladi.

**Kalit so'zlar:** plazma-elektrolitik oksidlanish usuli (PEO), Titan, elektrolitlar, namuna, galvanostatik va impuls rejimlari.

**TO OBTAIN A COATING ON TITANIUM ALLOYS BY THE  
PLASMA-ELECTROLYTIC OXIDATION METHOD PREPARATION OF  
SAMPLES**

**Annotation:** in the plasma-electrolytic oxidation method, electrical discharges create conditions for the inclusion of solute components formed on the basis of metal oxide, electrolytic deposition, including their thermolysis products

and layers of high-temperature interactions. Based on the characteristics of the method, several approaches to the formation of oxide layers in Valve metals with zirconium compounds are proposed.

**Keywords:** plasma-electrolytic oxidation method (PEO), Titanium, electrolytes, sample, galvanostatic and pulse modes.

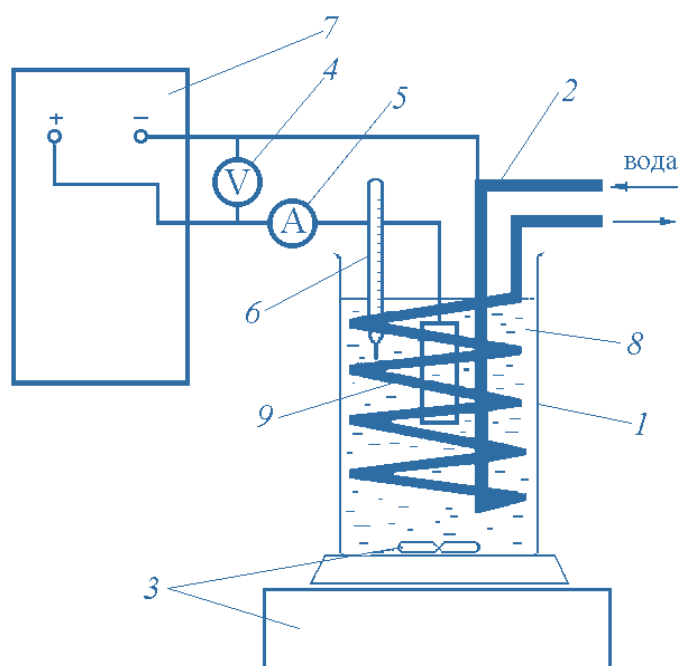
Oksid qoplamalari texnik jihatdan toza titan VT1-0 (Fe-0.25, C-0.07, Si-0.1, N-0.04, Ti-99.24-99.7, O-0.2, H - 0.1, boshqa 0.3 og'irligi%) namunalarida hosil bo'lgan. 20 mm dan 20 mm gacha bo'lgan titandan (VT1-0) tekis namunalar ishlatilgan. Metall qoplama kompozitsiyalarining o'ziga xos yuzasini aniqlash va katalitik sinovlarini o'tkazish uchun spiralga o'ralgan 1,2 mm kesimdagi titan simidan (VT1-0) namunalar tayyorlandi. Bunday namunalarning ishchi yuzasi 20 sm<sup>2</sup> ni tashkil qiladi. Anodlashdan oldin tekis namunalar o'tkir burchaklarni yumaloqlash va burmalarni olib tashlash uchun ishlov berildi.

Metallning sirt qatlamini olib tashlash va sirtni standartlashtirish uchun titan namunalari gidroflorik va nitrat kislotalar HFHNO<sub>3</sub>=1:3 aralashmasida 70°s da sayqallangan. Kislotalar aralashmasi suv muhitida isitiladigan plastik stakanga joylashtirildi. Jilvirlangandan so'ng, barcha namunalar avval oqava suv bilan, keyin distillangan suv bilan yuviladi va havoda quritiladi.

Elektrolitlarni tayyorlash namunalarni plazma-elektrolitik oksidlash uchun elektrolitlar distillangan suv va kimyoviy reaktivlar asosida tayyorlangan. 0,1 mol/l Zr(SO<sub>4</sub>)<sub>2</sub> dan iborat zirkonyum sulfat asosidagi eritmalar ishlatiladi. Distillangan suvdan foydalanib, 34.8 g/l Zr(SO<sub>4</sub>)<sub>2</sub> ·4H<sub>2</sub>O. o'z ichiga olgan ikkita asosiy elektrolitlar tayyorlandi. anod-uchqun tuzilmalarining shakllanishi texnik titanda plazma-elektrolitik oksidlanish qatlamlari galvanostatik rejimda 10 daqiqa davomida samarali oqim zichligi 0,08-0,2 A/sm<sup>2</sup> bo'lganda hosil bo'ladi.

Titanda oksid qoplamalarini olish uchun zirkonyum sulfat eritmaları ishlatilgan. Anodlash uchun elektrokimyoviy yachaykalar (1-rasm) hajmi 1000 ml bo'lgan shisha stakan, bir vaqtning o'zida muzlatgich bo'lib xizmat qilgan nikel qotishmasining ichi bo'sh naychasidan lasan shaklida tayyorlangan katod va magnit aralashtirgichdan iborat bo'ladi. Namunadagi kuchlanish va u orqali oqim mos

ravishda voltmeter va ampermetr, elektrolit harorati – termometr bilan boshqarildi. Oqim manbai sifatida TEP-100/460H-2-2YXJ14 tiristorli konvertor ijobiy kutupluluk oqimining impulsli shakli bilan ishlatilgan.



*1 - rasm. Namunalarni anodlash uchun o'rnatish sxemasi. 1-issiqlikka chidamli shisha stakan, 2 – katod, 3-magnit elementli magnit aralashtirgich, 4-voltmetr, 5-ampermetr, 6-termometr, 7- TEP4-100/460H-2-2YXJ14 tiristor birligi, 8-elektrolit, 9-qayta ishlangan namuna.*

Namunalardagi oksid qatlamlari galvanostatik va impuls rejimlarida hosil bo'lgan. Galvanostatik rejimda oqim zichligi  $I_a=0,08 \text{ A/sm}^2$  ni tashkil etdi. Impuls rejimida anod oqimining zichligi  $0,08 \text{ A / sm}^2$  ga teng bo'lib, katod oqimi anod oqimining  $\frac{1}{4}$  qismidan  $1,5 \cdot I_a$  gacha o'zgartirildi. Uchqun oksidlanishi paytida elektrolitning harorati  $26^\circ\text{C}$  dan oshmaydi.

Qayta ishlashdan so'ng, qoplamali namunalar oqadigan, keyin distillangan suv bilan yaxshilab yuviladi va  $20-70^\circ\text{C}$  haroratda havoda quritiladi.

Uchqun kuchlanishining kattaligi anod yuzasida birinchi uchqunlarning paydo bo'lishi yoki egri chiziqlar tahlilidan vizual ravishda baholandi (bog'liqlikning boshida elektrodlardagi kuchlanish chiziqli vaqtdan farq qiladi).  $Q^*$  ( $\text{KJ}\cdot\text{J}^{-1}$ ) elektrolitini ishlab chiqish uchun ma'lum bir vaqtda elektrokimyoviy hujayra orqali o'tkazilgan eritma hajmiga normallashtirilgan elektr energiyasi qabul qilindi.

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