

# Plasma spray coating with iron oxides for manufacturing of the corrosion-resistant electrodes

Katasonov P., Valiev R., Khafizov A., Shakirov Y.  
*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

---

## Abstract

© 2018 Institute of Physics Publishing. All rights reserved. Magnetite anodes were manufactured by plasma spray coating of titanium with the iron oxide powder. The powder was obtained by plasma-electrolytic atomization of carbon steel. Porosity, adhesion, specific resistivity of these coatings were measured in relation to size distribution and chemical composition of the powder used for spray coating.

<http://dx.doi.org/10.1088/1742-6596/1058/1/012004>

---

## References

- [1] Hayes M and Kuhn A T 1978 *Journal of Applied Electrochemistry* 8 327
- [2] Hideo I, Setsuo Y and Sakae I 1992 US patent 5143746
- [3] Sigaev N P, Zaharov V F, Travin A L, Horishko B A and Rumjancev E M 2003 *Izvestija VUZ Himija i himicheskaja tehnologija* 46 27
- [4] Kashapov N F and Sharifullin S N 2015 Hardening of the surface plasma jet high-frequency induction discharge of low pressure IOP Conference Series: Materials Science and Engineering 12021 "International Scientific and Technical Conference "Innovative Mechanical Engineering Technologies, Equipment and Materials-2014"
- [5] Khafizov A A, Shakirov Yu I, Valiev R A and Valiev R I 2017 Determination of regression materials microhardness, processed by low-temperature plasma dependence on process conditions *J. of Phys.: Conf. Ser.* 789 012024
- [6] Gabdrakhmanov A T, Israphilov I H, Galiakbarov A T, Samigullin A D and Gabdrakhmanov A T 2016 Improving the efficiency of plasma heat treatment of metals *J. of Phys.: Conf. Ser.* 669 012014
- [7] Bashmakov D A, Israphilov D I and Samigullin A D 2017 Mathematical modeling of the crystallization process to obtain a fine fraction aluminates IOP Conference Series: Materials Science and Engineering 240 012011
- [8] Gabdrakhmanov A T, Israphilov I. H and Galiakbarov A T 2017 Preparation of metal surfaces for application of functional coatings *J. of Phys.: Conf. Ser.* 789 012009
- [9] Gabdrakhmanov A T, Shafigullin L N, Galimov E R and Ibragimov A R 2017 Surface thermohardening by the fast-moving electric arch *J. of Phys.: Conf. Ser.* 789 012010
- [10] Tazmeev A K, Tazmeeva R N and Sarvarov F S 2016 The features of high-current gas discharge in a narrow gap between the liquid electrolyte and solid electrode *J. of Phys.: Conf. Ser.* 669 012056
- [11] Gibadullina G R, Tazmeev A K and Tazmeeva R N 2017 Recycling of polymer waste by liquid electrolyte plasma generators *Journal of Fundamental and Applied Sciences* 9 1779-1789
- [12] Valiev R A, Gaisin F M and Shakirov Yu I 1991 Special traits of powder obtained in discharge between steel electrode and electrolyte *Soviet Powder Metallurgy and Metal Ceramics* 30 448
- [13] Khafizov A A, Shakirov Y I, Valiev R A, Valiev R I and Khafizova G M 2016 Study of thermal and electrical parameters of workpieces during spray coating by electrolytic plasma jet *J. of Phys.: Conf. Ser.* 669 012030
- [14] Valiev R I, Shakirov Yu I, Khafizov A A, Valiev R A and Nuriev I M 2017 Generalized current-voltage characteristics of electric discharge liquid cathode *J. of Phys.: Conf. Ser.* 789 012067

- [15] Borisov Ju S, Harlamov Ju A, Sidorenko S L and Ardatovskaja E N 1987 Gazotermicheskie pokrytija iz poroshkovyh materialov. Spravochnik (Kiev: Naukova dumka) 544
- [16] Wakabayashi S and Aoki T 1977 Journal de physique. Colloque C1, supplement au 38 241