



ALUMINIY QOTISHMALARINI GERMANIY OKSIDI TA'SIRIDA OKSIDLANISHI

Sarvar Tursunbayev^{1,2}, Sherzod Tashbulatov^{1,2}, Sharofuddin
Mardonaqulov¹, Nargiza Nazarova¹, Shohruh Xudoyqulov^{1,2}

¹Islom Karimov nomidagi Toshkent davlat texnika universiteti, O'zbekiston

²O'zbekiston-Yaponiya yoshlar innovatsiya markazi, O'zbekiston

Aluminiy kumushsimon oq rangda bo'lib elektr va issiqlik o'tkazuvchi yengil metallidir. Aluminiy bosim ostida yaxshi ishlanadi, payvandlanadi, lekm kesib ishlanishi yomon. Atmosfera va chuchuk suvda korrozyaga chidamliligi yuqori. Havoda aluminiy tez oksidlanadi [1-4]. Aluminiyning boshqa metall va nometallar (mis, marganes, magniy, kremniy, temir, nikel, titan, berilliy va boshqalar) bilan qotishmalari konstruksion materiallar sifatida keng qo'llaniladi. Aluminiy turli elementlar bilan legirlab, mikrolegirlab va modifikatsiyalab ishlov berish orqali uning xossalarini yaxshilashga qaratilgan tajribalar dunyo olimlari tomonidan juda ko'plab o'tkazilgan [5-8].

Ushbu tadqiqot ishida quyma aluminiy qotishmasi tarkibiga germaniy oksidi kiritilib, uning oksidlanishi o'rganilgan. Tajribada AMg5 markali qotishma tarkibiga germaniy oksidi kiritilgan. Namunalar tarkibi quyidagi 1- jadvalda berilgan.

1-jadval.

Namunalar tarkibi

№	Nomi	Massa hisobida elementlar ulushi, %									
		Al	Si	Fe	Cu	Mn	Mg	Ti	Be	Zn	Ge
1	AMr5	91,9-94	0,5	0,5	0,1	0,3-0,8	4,8-5,8	0,1	0,005	0,2	-
2	AMr5	91,9-94	0,5	0,5	0,1	0,3-0,8	4,8-5,8	0,1	0,005	0,2	0,1
3	AMr5	91,9-94	0,5	0,5	0,1	0,3-0,8	4,8-5,8	0,1	0,005	0,2	0,2
4	AMr5	91,9-94	0,5	0,5	0,1	0,3-0,8	4,8-5,8	0,1	0,005	0,2	0,3

Oksid germaniy binarniy yarim metall birikma hisoblanib, germaniy va kislorod birikmasidir. Formulasi GeO. Rangi kulrang-qora bo'lib, suvda yaxshi erimaydi.

Namunalarni qum-gilli qoliplarga quyib olindi (1-rasm). Qolip aralashmalari tarkibi quyidagilardan iborat: 85% kvarts qumi, 11% bentonit gili va 4% suvdan iborat [9]. Namunalar qarshilik pechida quyib olindi. Namunalar 780 °C haroratda quyib olindi [10]. Quyib olingan namunalar 2-rasmda berilgan.

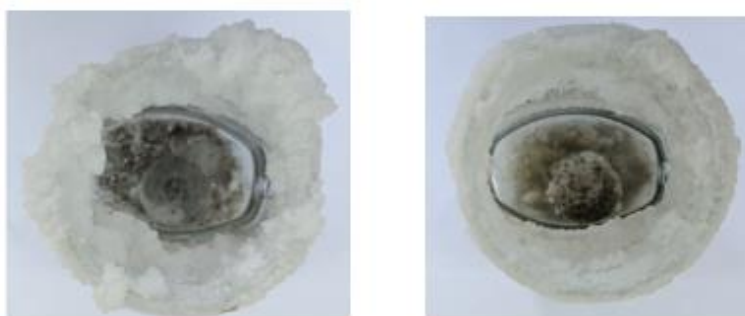


1-rasm. Qarshilik pechi.



2-rasm. Namunalar.

Quyilgan namunalardan kichik bo‘laklar kesib olinib, natriy xlorli va vodorod peroksid eritmalariga solindi va 30 kun davomida sinovdan o‘tkazildi. Eritmadagi namunalar 3-rasmda berilgan.



3-rasm. Eritmadagi namunalar:
1-germaniy oksidi qo‘shilmagan; 2- germaniy oksidi qo‘shilgan.

Eritmadagi namunalarni vizual kuzatuvlardan quyidagini xulosa qilish mumkin. Yuqoridagi namunalarning rasmdan ko‘rinib turibdiki, germaniy oksidi ta’sirida aluminiy qotishmasini oksidlanishi kamaygan.



Foydalanilgan adabiyotlar

1 Tursunbayev, S., Turakhodjaev, N., Turakhujaeva, S., Ozodova, S., Hudoykulov, S., & Turakhujaeva, A. (2022, August). Reduction of gas porosity when alloying A000 grade aluminum with lithium fluoride. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1076, No. 1, p. 012076). IOP Publishing.

2 Kaufman, J. G., & Rooy, E. L. (2004). Aluminum alloy castings. *Properties, Processes and Applications. ASM International, 10*.

3 Rana, R. S., Purohit, R., & Das, S. (2012). Reviews on the influences of alloying elements on the microstructure and mechanical properties of aluminum alloys and aluminum alloy composites. *International Journal of Scientific and research publications, 2*(6), 1-7.

4 Nodir, T., Sarvar, T., Kamaldjan, K., Shirinkhon, T., Shavkat, A., & Mukhammadali, A. (2022). The effect of lithium content on the mass of the part when alloyed with lithium aluminum. *International Journal of Mechatronics and Applied Mechanics, 2022*(11), Pp: 52–56.
<https://doi.org/10.17683/ijomam/issue11.7>

5 Ma, Z., Zhong, T., Sun, D., Qian, B., Turakhodjaev, N., Betsofen, S., & Wu, R. (2023). Microstructure and Anisotropy of Mechanical Properties of Al-3Li-1Cu-0.4 Mg-0.1 Er-0.1 Zr Alloys Prepared by Normal Rolling and Cross-Rolling. *Metals, 13*(9), 1564.

6 Tursunbaev, S., Turakhodjaev, N., Saidxodjayeva, S., & Hudoykulov, S. (2023). INFLUENCE OF ALLOYING ELEMENTS ON ALUMINUM ALLOYS. *International Journal of Advance Scientific Research, 3*(09), 46-50.

7 Tursunbaev, S., Turakhodjaev, N., Mardonakulov, S., & Toshmatova, S. (2024). Effect of germanium oxide on the properties of aluminum casting details in agricultural machinery. In *BIO Web of Conferences* (Vol. 85, p. 01024). EDP Sciences.

8 Tursunbaev, S., Turakhodjayev, N., Mardanokulov, S., & Tashbulatov, S. (2023). Influence of germanium oxide on the mechanical properties of aluminum alloy. *Eurasian Journal of Engineering and Technology, 16*, 91-94.

9 Tursunbayev, S., Turakhodjayev, N., Mardanokulov, S., Zokirov, R., & Odilov, F. (2023). The effect of lithium on the mechanical properties of alloys in the Al-Li system. In *E3S Web of Conferences* (Vol. 390, p. 05046). EDP Sciences.

10 Sarvar, T. (2022). Changes in its Wear Resistance When Alloying Aluminum Alloys with Lithium. *Texas Journal of Engineering and Technology, 12*, 32-36.