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RADIOCHEMICAL POLYMERIZATION OF POLYACRYLIC ACID TO TRACK-ETCHED MEMBRANES BASED ON PVDF-HFP DOPED WITH GRAPHENE OXIDE

PVDF-based membranes are widely used for various applications (filtration, sensors, energy storage, fuel cells, etc.) due to their exceptional properties. The radiochemical polymerization (RCP) of the polyacrylic acid (PAA) to PVDF TeMs was previously studied in detail previously and the obtained TeMs samples were successfully tested as sensitive sensors of lead ions. However, it is worth noting that detailed studies of the features of RCP to TeMs based on PVDF-HFP, including doped with graphene oxide (GO), have yet to be carried out. This study presents the results of determining the optimal conditions for the RCP of PAA, providing the maximum value of the monomer grafting degree. The influence of various factors on the value of the RCP grafting degree was studied: monomer and inhibitor concentration, RCP time and temperature, and the effect of the PVDF-HFP-GO etching time was also studied in detail. The findings of this study not only contribute to the understanding of RCP to TeMs but also provide practical guidelines for optimizing the process, thereby enhancing the development of advanced materials in the field of materials science. Based on the conducted studies, the optimal conditions for the RCP of PAA on the surface of PVDF-HFP TeMs doped GO, were selected, namely: temperature - 30 ℃, inhibitor concentration (Mohr's salt) - 0.05 M, monomer concentration [PAA/H2O] = 80/20%, grafting time - 60 min. Changing the TeMs etching time did not significantly affect the efficiency of the RCP of PAA.

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Section

Energy and materials science (Section 2)

Primary authors: Mr ALMANOV, Alimzhan (The Institute of Nuclear Physics of the Republic of Kazakhstan, 050032 Almaty, Kazakhstan); Ms TOLEGEN, Anel (L.N. Gumilyov Eurasian National University, 010008 Astana, Kazakhstan)

Co-authors: Prof. MASHENTSEVA, Anastassiya (The Institute of Nuclear Physics of the Republic of Kazakhstan, 050032 Almaty, Kazakhstan); Prof. BARSBAY, Murat (Hacettepe University, Ankara, Turkiye)

Presenters: Mr ALMANOV, Alimzhan (The Institute of Nuclear Physics of the Republic of Kazakhstan, 050032 Almaty, Kazakhstan); Ms TOLEGEN, Anel (L.N. Gumilyov Eurasian National University, 010008 Astana, Kazakhstan)

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