[논문] Advancement in Soft Iontronic Resistive Memory Devices and Their Application for Neuromorphic Computing

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[논문] Advancement in Soft Iontronic Resistive Memory Devices and Their Application for Neuromorphic Computing
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초록(Abstract)
The aqueous electrolyte can be a deformable and stretchable liquid material for iontronic resistive memory devices. An aqueous medium makes a device closer to the brain-like system with the movement of ions. This review paper proposes advances in liquid resistive memories and neuromorphic computing behavior to emulate electronic synapses. Primarily, the aqueous iontronic resistive memories can be used to study electrode and active layer materials and different device structures. Hence, herein, a timely and comprehensive study of these devices using ionic liquids, hydrogels, salt solutions, and soft electrodes to classify the device mechanism is presented. The filament formation is discussed in detail based on ion concentration polarization, electrode metallization, and movements of ions and charged molecules, which result in the formation of the metal dendrite. To manufacture a higher-performance memory, device parameters should be optimized based on aqueous electrolytes, electrode materials, and other device design parameters. Aqueous electrolytes have smooth neurotransmission
ability to fabricate brain-inspired resistive memories with stable performance and device repeatability with smooth ion transmission. Aqueous electrode materials can be reliable for neural interface activities to compute electronic synapsis with electrical and chemical properties to ensure device reliability for a longer time period.
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