This manuscript reports a type of multilayered HfOx/TiOy memristor for neuromorphic computing. The volatile/non-volatile switching can be tuned by size-controlled atomic oxygen vacancy pathway. The integrate-and-fire function is achieved by tunable threshold switching characteristics. At last, one SNN is designed for audio signal processing. However, the manuscript needs a major revision before publication in *Nanomaterials.* The comments are as follows:

(1) The firing frequency increases with the amplitude increase of the applied pulses. However, in biological neurons, the frequency of the pre-synaptic pulses matters. The author should also provide the results on how the firing frequency changes with the applied input pulses.

(2) As shown in Figure 2, the device can change threshold switching behavior to memory switching state by increase the I_{CC}. Is this process reversible?

(3) In the SNN neural network, are the synapse and neuron both implemented by the HfOx/TiOy memristor? If yes, how can the author define the synapse and neuron using the same device?

(4) The scale bar is missing in Figure 1(b).