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## Sommario/riassunto

This thesis describes an investigation into homogeneous KN crystalline films grown on Pt/Ti/SiO<sub>2</sub>/Si substrates, amorphous KN films grown on TiN/Si substrates using the RF-sputtering method, and the ferroelectric and piezoelectric properties of these KN films. KNbO<sub>3</sub> (KN) thin films have been extensively investigated for applications in nonlinear optical, electro-optical and piezoelectric devices. However, the electrical properties of KN films have not yet been reported, because it is difficult to grow stoichiometric KN thin films due to K<sub>2</sub>O evaporation during growth. This thesis also reports on the ReRAM properties of a biocompatible KN ReRAM memristor powered by the KN nanogenerator, and finally shows the biological synaptic properties of the KN memristor for application to the artificial synapse of a neuromorphic computing system.

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