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Conductive Barrier Layers of TiN_x for Measurements of Silicon Films at High Temperature BRIAN KEARNEY, national research council, BATTOGTOKH JUGDERSUREN, Sotera Defense Solutions, XIAO LIU, Naval Research Lab, Code 7130 — Electrical measurements of Silicon-based thin films can be challenging at high temperatures due to silicide formation and inter-diffusion of silicon with metal leads. We examine thin sputtered titanium nitride (TiN_x) films and demonstrate that by saturating the TiN_x with Nitrogen and using the proper deposition and annealing temperatures, a stable, conductive barrier is produced. Rutherford backscattering (RBS) is used to characterize the film density and composition, conductivity is measured up to 750 K. A sputtered platinum film is deposited on TiN_x to further test the effectiveness of the barrier versus a silicon substrate. These films show excellent stability and conductivity after repeated thermal cycling, making them ideal for high temperature electrical measurements of silicon-based thin films.

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