

DEPOSITION OF ENHANCED SEED LAYER USING TANTALUM ALLOY BASED SPUTTER TARGET

ABSTRACT OF THE DISCLOSURE:

A seedlayer for a magnetic recording medium, the seedlayer formed over a substrate from a sputter target comprised of tantalum (Ta) and an alloying element. The solubility of the alloying element in a body centered cubic tantalum (Ta) phase does not exceed 10 atomic percent at room temperature, and the alloying element has a mass susceptibility of less than or equal to $1.5 \times 10^{-7} \frac{m^3}{kg}$, where possible alloying elements include (but are not limited to) boron (B), carbon (C), aluminum (Al), silicon (Si), titanium (Ti), vanadium (V), manganese (Mn), chromium (Cr), zirconium (Zr), niobium (Nb), molybdenum (Mo), ytterbium (Yb), lutetium (Lu), hafnium (Hf), bismuth (Bi), and tungsten (W). Alternatively, the alloying element is soluble in tantalum (Ta) at room temperature or at elevated temperatures, has a mass susceptibility of less than or equal to $1.5 \times 10^{-7} \frac{m^3}{kg}$, and has an atomic radius smaller than $1.47\text{\AA}$, where possible alloying elements include (but are not limited to) boron (B), carbon (C), aluminum (Al), silicon (Si), chromium (Cr), ruthenium (Ru), rhodium (Rh), rhenium (Re), iridium (Ir) and platinum (Pt). Further alternatively, the solubility of the alloying element in a body centered cubic tantalum (Ta) phase does not exceed 10 atomic percent at room temperature, and the alloying element has a mass susceptibility of less than or equal to $1.5 \times 10^{-7} \frac{m^3}{kg}$, is soluble in tantalum (Ta) at temperatures higher than room temperature, and has an atomic radius smaller than $1.47\text{\AA}$, where possible elements include (but are not limited to) boron (B), carbon (C), aluminum (Al), silicon (Si), platinum (Pt), and chromium (Cr).