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A nanoscopic study of degradation of optical recording media
KWONJAE YOO, H.R. KANG, K.J. KIM, B.C. WOO, D.A. HA, N.H. LEE, WAN S. YUN, KRISS, Daejeon 305-340, Korea, M.Y. YUN, Joongbu University, Chungnam 312-702, Korea — The life expectancy of optical recording media usually depends on loss of physical property, that is, optical elements in digital recording unit cells eventually will be disappeared by physical and chemical degradation. Nevertheless, the study of information loss in the element by natural degradation is not so many, which need a practical and scientific investigation in detail. Here we present the results of the life expectancy of archiving DVDs and their optical and atomic force microscopy studies on the recording unit cells by employing accelerated aging tool. Our results showed that archiving DVDs, which have double reflective layers, indicate the acceptable life expectancy over one hundred years. Additional optical, Surface Kelvin probe microscopy (SKPM) and electrostatic force microscopy (EFM) measurements clearly reveal the degradation of dye layer depending on accelerated aging time. The correlation between those physical quantities and PI errors might lead a key factor for the development of new life expectancy estimation method of optical recording media.

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