Fe-42Ni alloy sheets by electroforming method for metal encapsulant of organic light emitting diodes

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Fe-42Ni(58wt\% of Fe and 42wt\% of Ni) alloy sheets were deposited by electroforming method to apply metal encapsulation layers of organic light emitting diodes(OLED). Because Fe-42Ni alloy has the low coefficient of thermal expansion(CTE) and the high barrier performance against water vapor transmission and oxygen transmission\cite{1, 2}.

The composition of Fe and Ni elements is confirmed to 58wt\% of Fe and 42wt\% of Ni by X-ray fluorescence(XRF) analysis. Also, thermo-mechanical analysis(TMA) shows that the CTE of Fe-42Ni alloy after thermal treatment is below 6ppm/\degree C between 0~300\degree C and the water vapor transmission rate(WVTR) is below 0.005g/m\text{2}/day.

As the result of the OLED device test, the electroformed Fe-42Ni alloy show the same performance as the conventional rolled Fe-42Ni alloy after environmental test for 500hrs under relative humidity of 85\% and temperature at 85\degree C. It indicates that the electroformed Fe-42Ni alloy sheets are sufficiently applicable to the metal encapsulant of OLEDs.

References