Finding of anomalously large magnetoresitance effect in C_{60}-Co thin films

Nanometer-scale hybrid films of Co nanoparticle/C_{60}-Co compound are found to exhibit a large tunnel megnetoresitance (TMR) effect. The MR ratio attains 80% at the maximum, depending on the applied bias voltage. (see Fig. 1)

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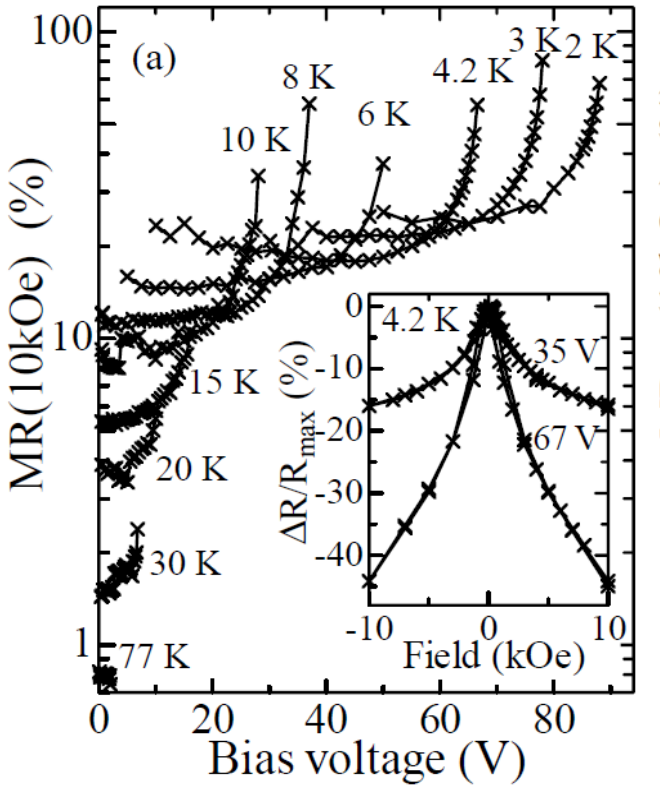


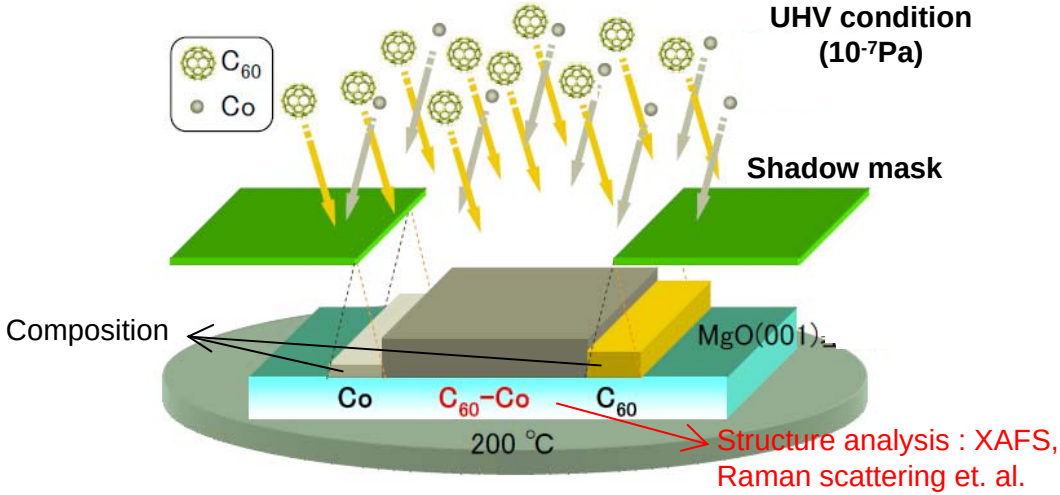
Fig. 1 Bias voltage dependence of MR at 10 kOe and MR-magnetic field curves at 4.2 K (inset)

MR ratio = $(R_{max} - R) / R_{max}$

Large MR effect

~ High spin-polarization of the tunnel electrons at the interfaces of Co particle/C_{60}-Co compound

Fig. 2 Sample preparation method



Alternate deposition of C_{60} and Co (~50 cycles) → ~100nm-thick film

Nanogranular films : Co nanoparticles with the average size of 3 nm are embedded in a matrix of the C_{60}-Co compound, $C_{60}Co_4$.