Revealing the impact of strontium doping on the optical, electronic and electrical properties of the nanostructured 2H-$CuFeO_2$ delafossite thin films

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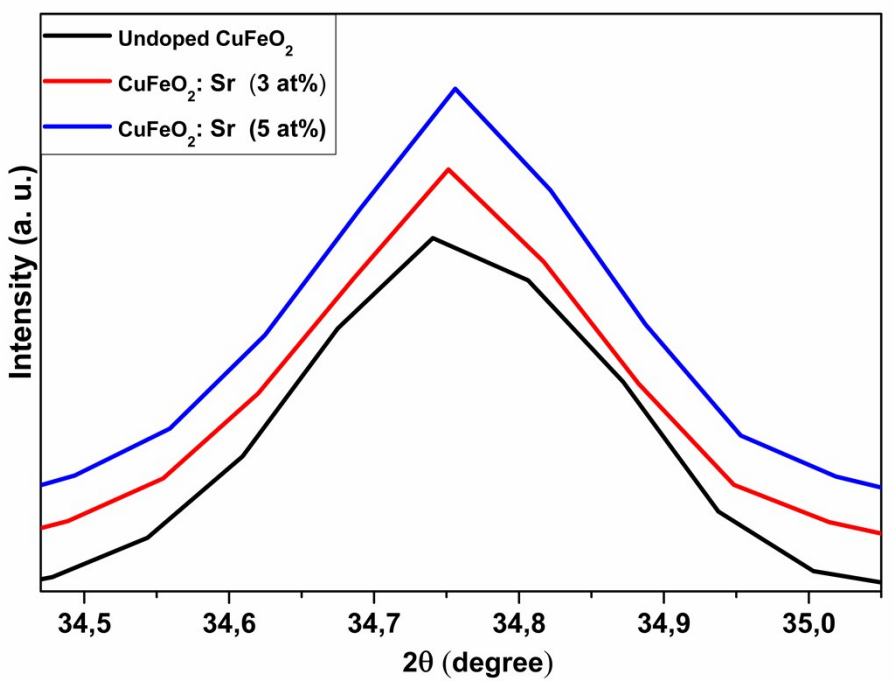


Fig. S1 Magnified XRD peaks in the region of the (101) plane for the pure and Sr-doped $CuFeO_2$ thin films.

Table S1. Structural parameters of the pure and Sr-doped $CuFeO_2$ thin films from XRD data; Lattice parameters, Crystallite size.

Compound	Space group	Lattice parameters (Å)		D (nm)
		a	c	
$CuFeO_2$	$P6_3/mmc$	3.0532	11.52	27
$CuFeO_2$:Sr^{2+} (3%)	$P6_3/mmc$	3.0514	11.4975	31
$CuFeO_2$:Sr^{2+} (5%)	$P6_3/mmc$	3.0496	11.4802	48

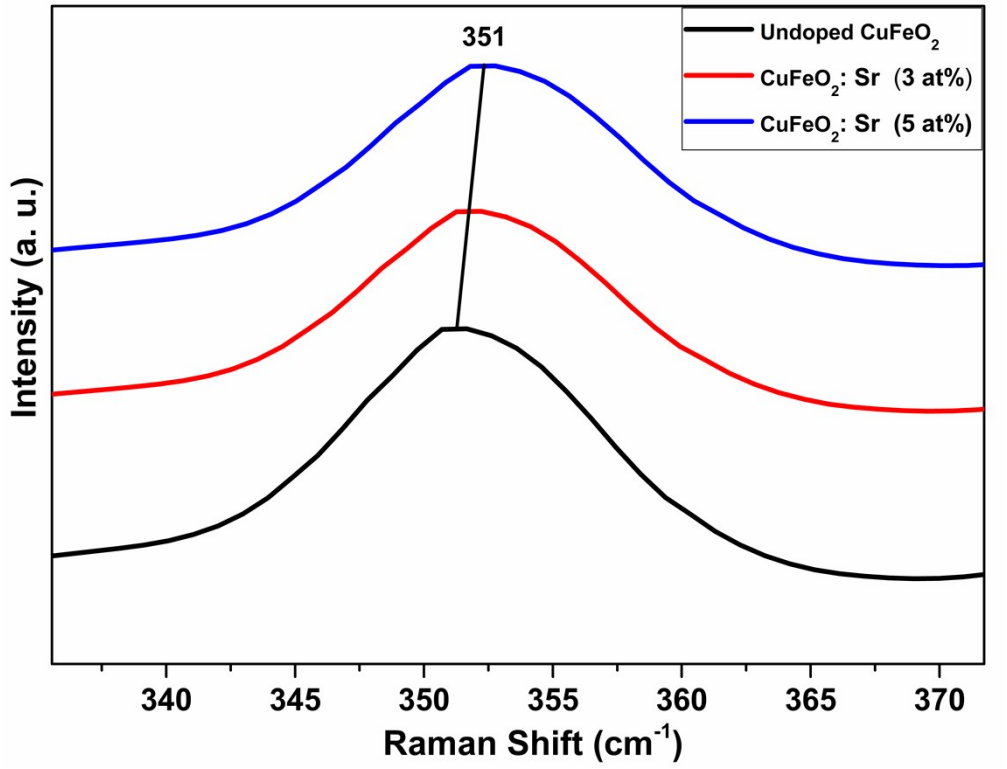
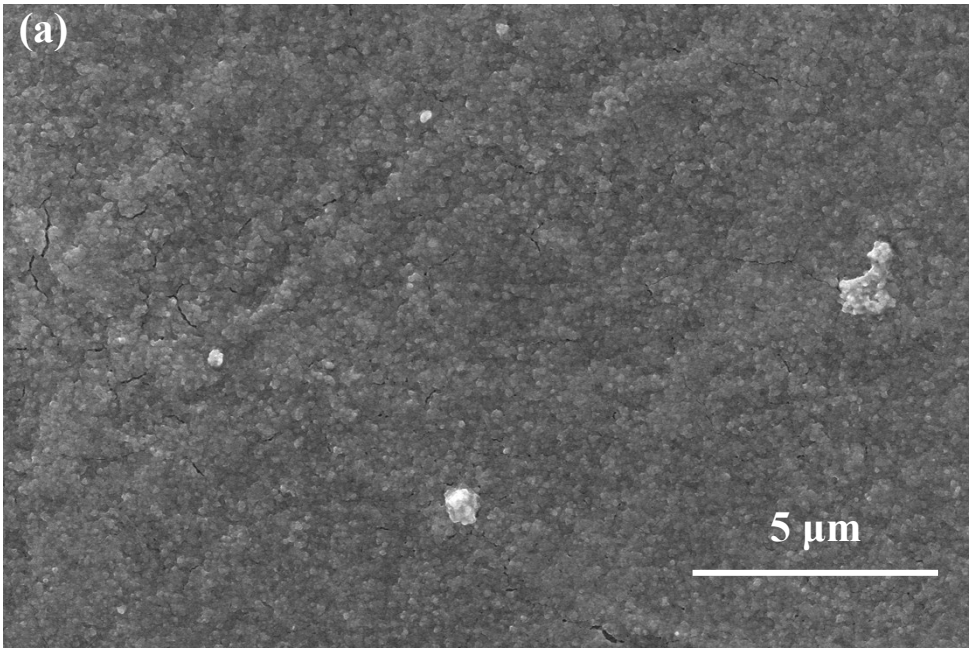


Fig. S2 Magnified Raman signal in the region of the 351 cm^{-1} mode for the pure and Sr-doped $CuFeO_2$ thin films.



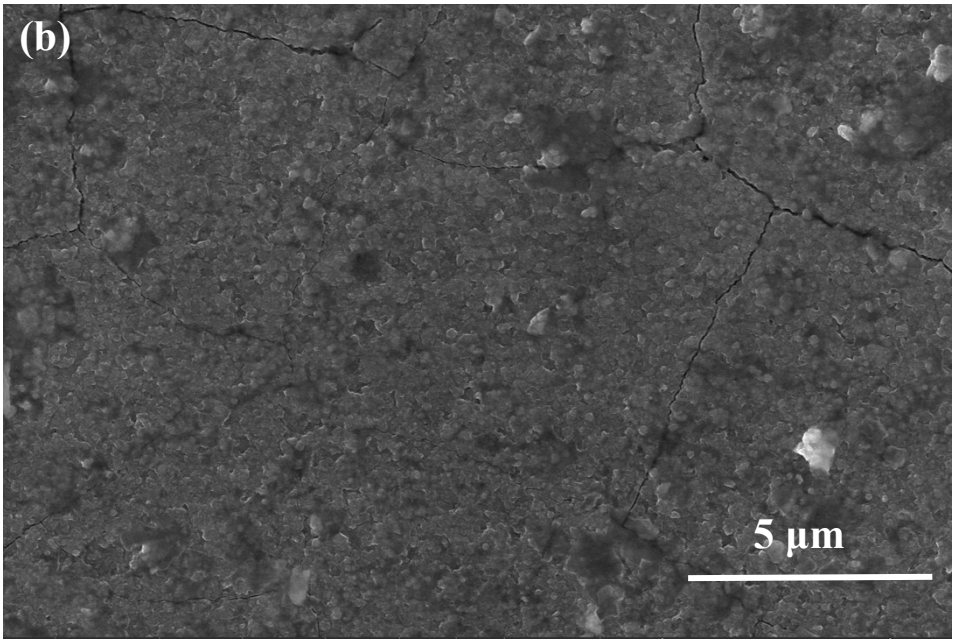


Fig. S3 Top-view of Sr-doped $CuFeO_2$ thin film **(a)** 3% and **(b)** 5%.

Table S2. Atomic concentrations of the different $Cu_{1-2x}Sr_xFeO_2$ elements obtained by EDX analysis.

Samples	Atomic percentages			
	Cu	Fe	O	Sr
$CuFeO_2$	24.34	24.59	51.07	0
$CuFeO_2$:Sr^{2+} (3%)	23.10	24.58	51.61	0.71
$CuFeO_2$:Sr^{2+} (5%)	21.76	24.20	52.94	1.10

Table S3. Conductivity type, carrier concentration, mobility and resistivity value of the pure and Sr-doped $CuFeO_2$ thin films.

Samples	Type of conductivity	Carrier concentration (Cm^{-3})	Mobility μ ($cm^2\ V^{-1}\ s^{-1}$)	Resistivity (Ωcm)
$CuFeO_2$	p	$5.7.10^{16}$	7.9	4.9
$CuFeO_2:Sr^{2+}$ (3%)	p	$4.1.10^{16}$	9.5	4.3
$CuFeO_2:Sr^{2+}$ (5%)	p	$3.6.10^{16}$	12.1	3.5