Electronic Supplementary Material (ESI) for RSC Advances.

Investigation of optical, dielectric, and conduction mechanism in lead-free perovskite $CsMnBr_3$.

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Figure S1: Image of the obtained crystals for $CsMnBr_3$ compound.

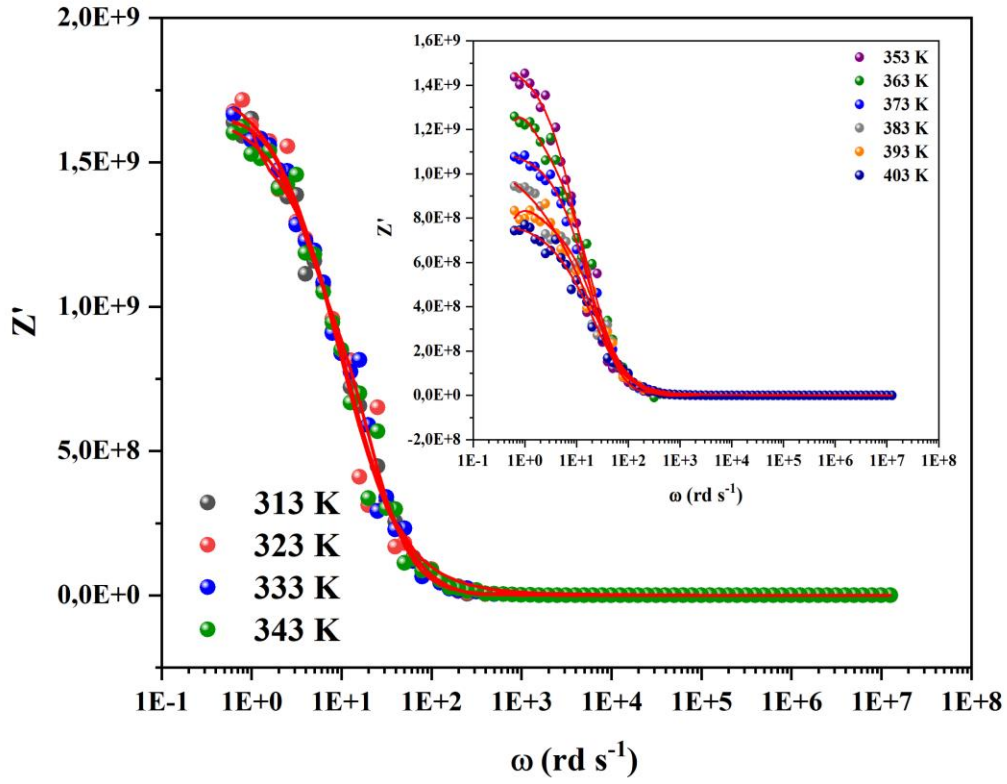

Figure (S2): Frequency dependence of real part of the impedance of $CsMnBr_3$ compound.

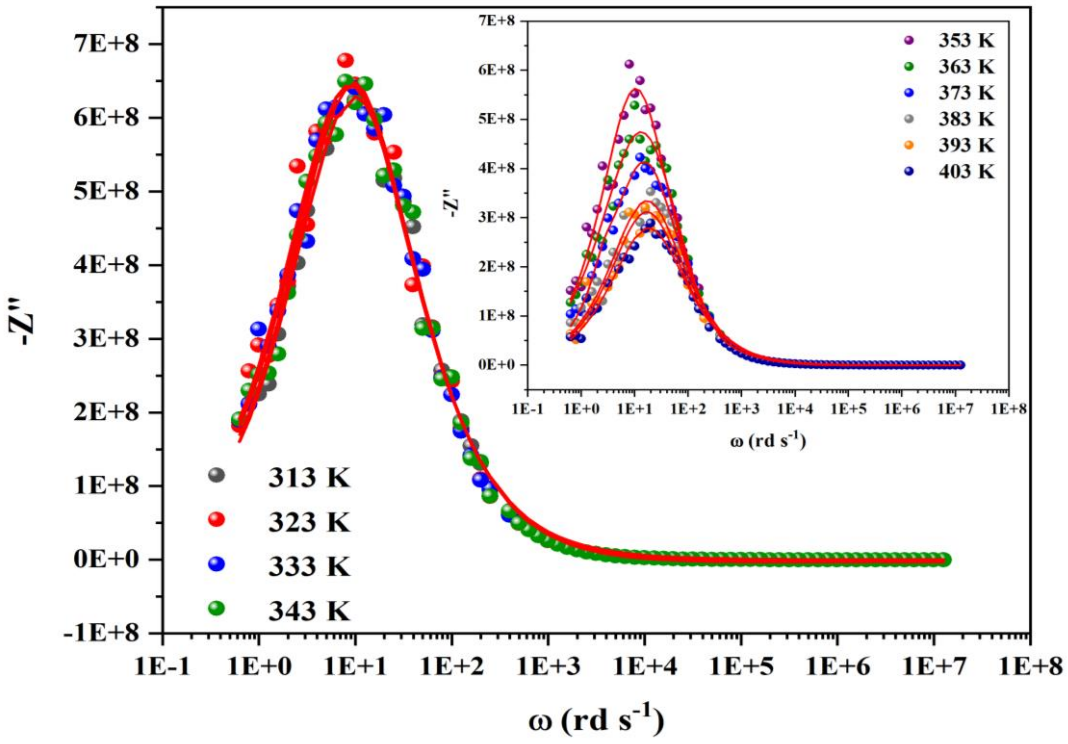

Figure (S3): Frequency dependence of imaginary part of electrical impedance of $CsMnBr_3$ compound.

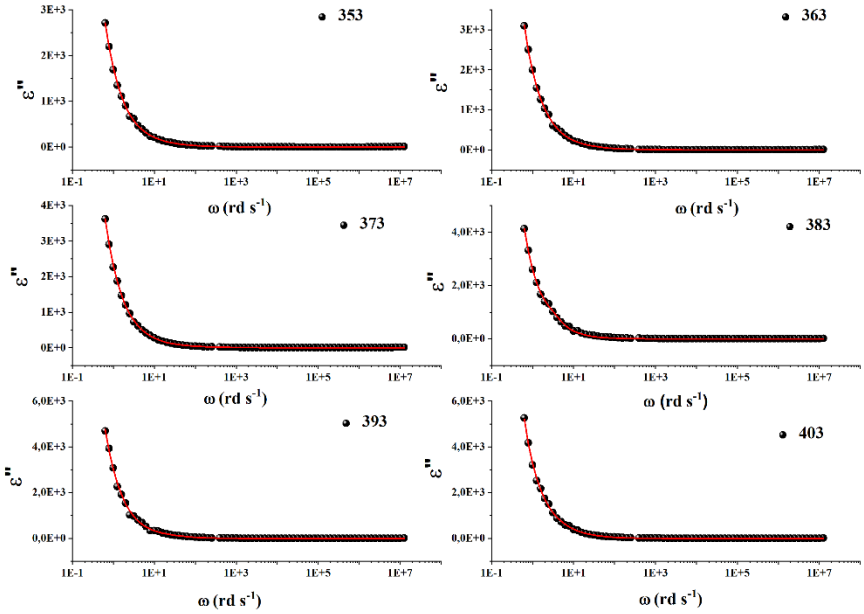

Figure (S4): Frequency-dependent imaginary part of dielectric permittivity at different temperatures.

Temperature (K)	τ	α	M	σ_{fc}
353	**$1.493x10^{-8}$**	**0.325**	**0.425**	**$1.32x10^{-5}$**
363	**$1.324x10^{-8}$**	**0.453**	**0.481**	**$3.635x10^{-5}$**
373	**$1.192x10^{-4}$**	**0.562**	**0.524**	**$4.325x10^{-5}$**
383	**$9.254x10^{-5}$**	**0.584**	**0.632**	**$5.012x10_{-5}$**
393	**$7.326x10^{-8}$**	**0.643**	**0.752**	**$5.832x10^{-5}$**
403	**$5.236x10^{-5}$**	**0.724**	**0.784**	**$6.325x10^{-5}$**

Table S1: The parameters τ , α, m and σ_{fc}evaluated from the fitting of the dielectric loss with the modified Cole - Cole model.

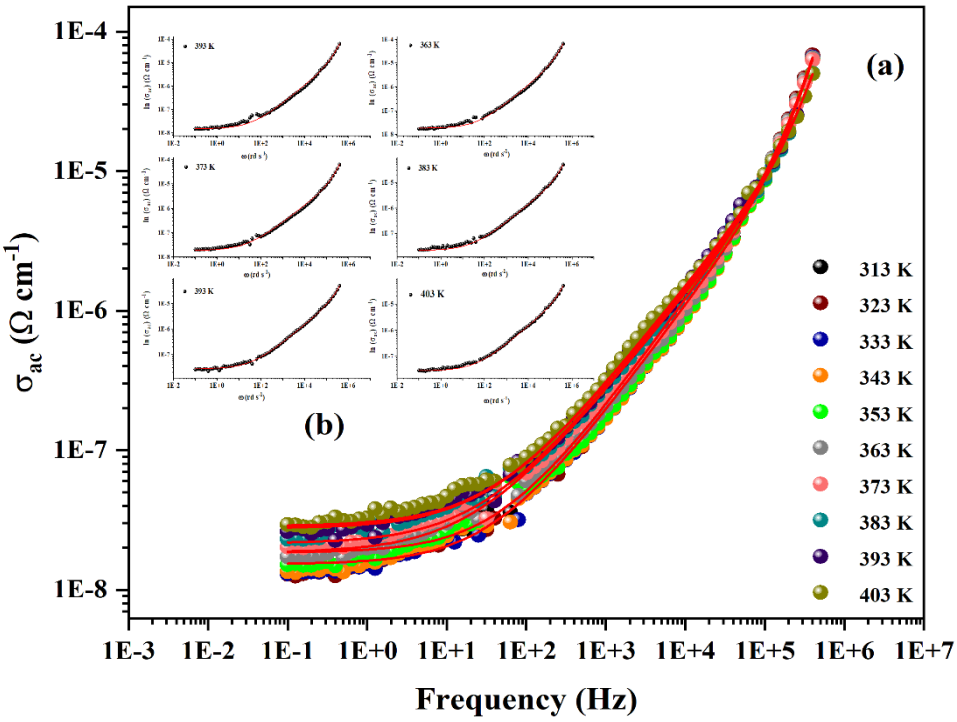

Figure (S5): Fitted curves of AC conductivity of $CsMnBr_3$ compound.

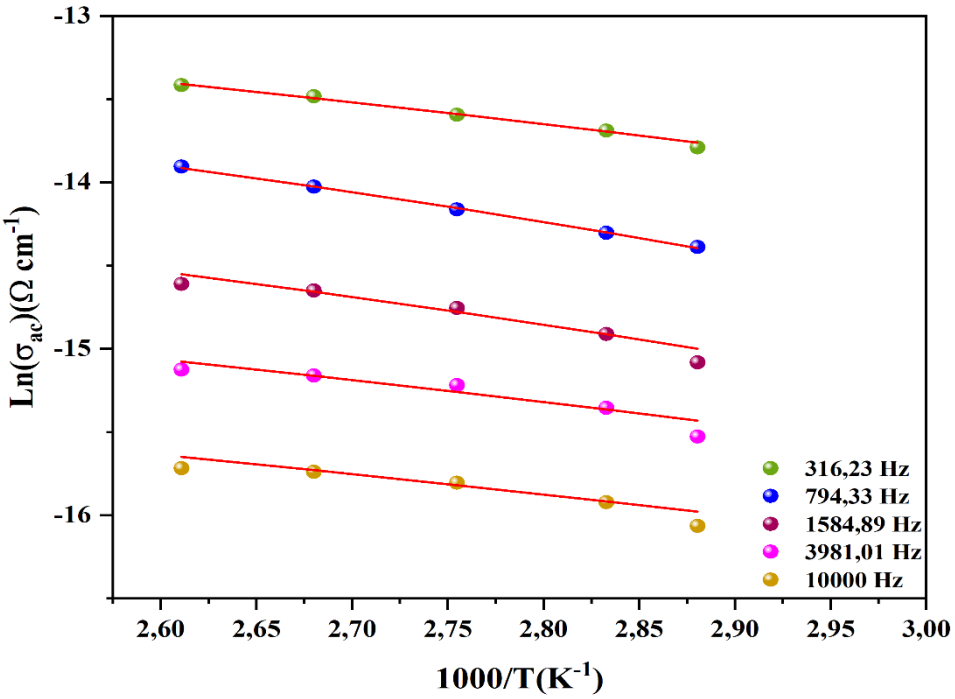

Figure (S6): Temperature dependence of AC conductivity for the CBH model.

Frequency (Hz)	**N_T $10^{22}cm^{-3}$)**	**w_H(eV)**
316.23	**2.24**	**0.60**
794.33	**2.04**	**0.706**
1584.89	**1.867**	**0.78**
3981.01	**1.77**	**0.74**
10000	**1.567**	**0.72**

Table (S2): parameter resulting from NSPT fit.