Supplementary Information

Abnormal Electronic Transport Properties with Hall Effect, Magneto-resistivity, and Phase Diagram in CaFeAsF Single Crystal

Yongqiang Pan[1,+], Nan Zhou[1,+], Wei Zhou[2,+], Tianyang Wang[1], Qiang Hou[3], Run Lv[1], Ming Cheng[1], Ruihuan Lan[1], Yifan Deng[1], Yu Zhao[1], Lanxin Liu[1], Wenhai Song[1], Yue Sun[3], Zhixiang Shi[3], Wenjian Lu[1], Xuan Luo[1,*], Yuping Sun[1,4,5]

[1]Key Laboratory of Materials Physics, Institute of Solid State Physics, HFIPS, Chinese Academy of Sciences, Hefei 230031, China

[2]Advanced Functional Materials Lab and Department of Physics, Changshu Institute of Technology, Changshu 215500, People's Republic of China

[3]School of Physics and Key Laboratory of the Ministry of Education, Southeast University, Nanjing 211189, China

[4]Anhui Province Key Laboratory of Low-Energy Quantum Materials and Devices, HFIPS, High Magnetic Field Laboratory, Chinese Academy of Sciences, Hefei, 230031, China

[5]Collaborative Innovation Center of Advanced Microstructures, Nanjing University, Nanjing, 210093, China

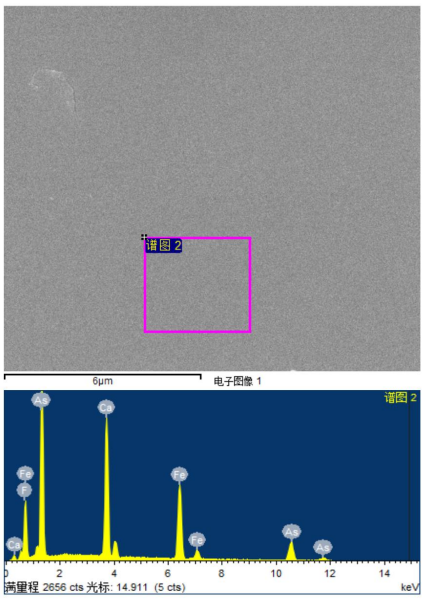


Table S1

Elements percentage from EDS		
Elements	Weight Percentage	Atomicity Percentage
F	16.46	37.33
Ca	18.95	20.37
Fe	26.20	20.22
As	38.39	22.08
Total	100.00	

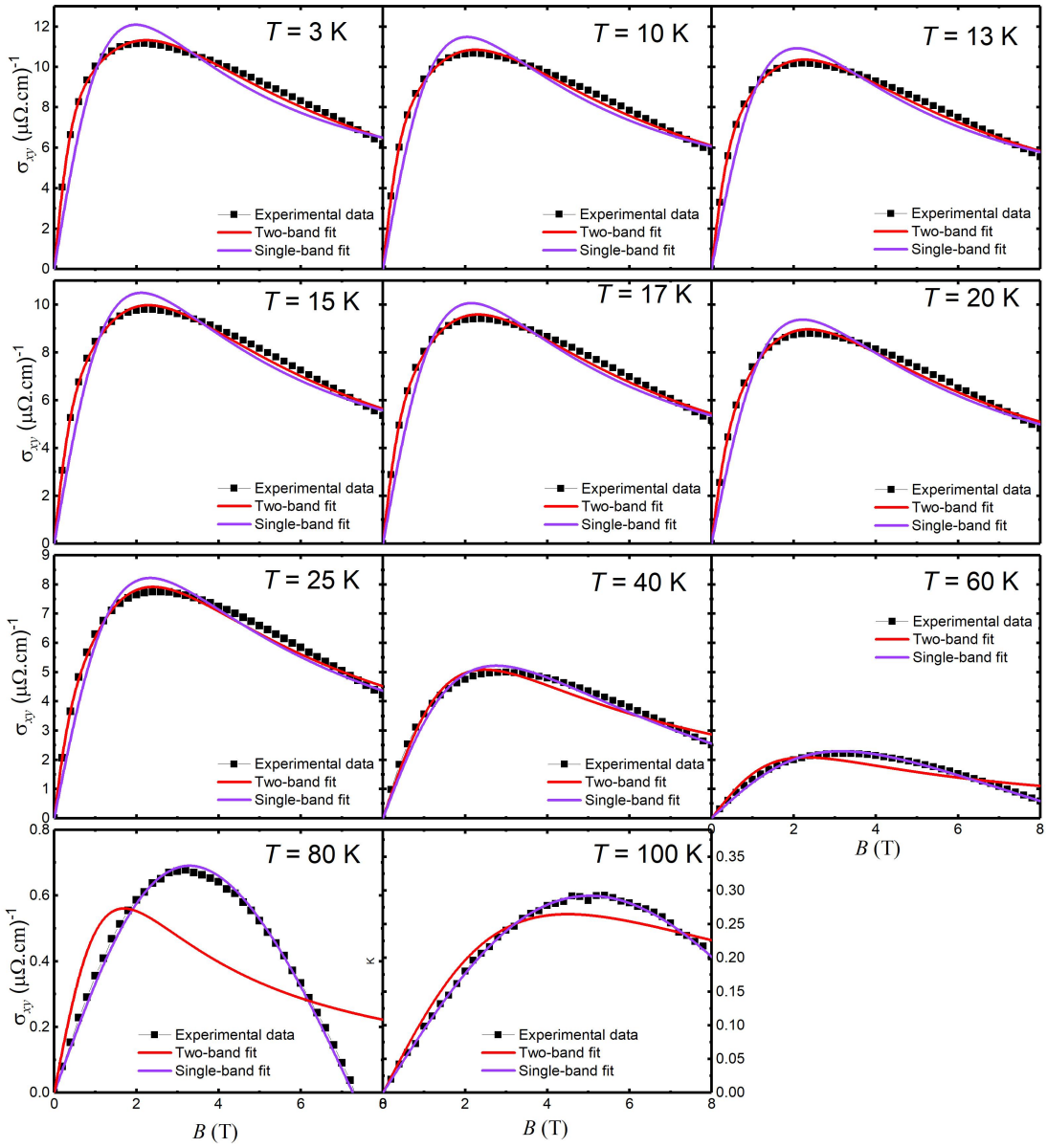
Table S2

ICP atomic emission spectroscopy

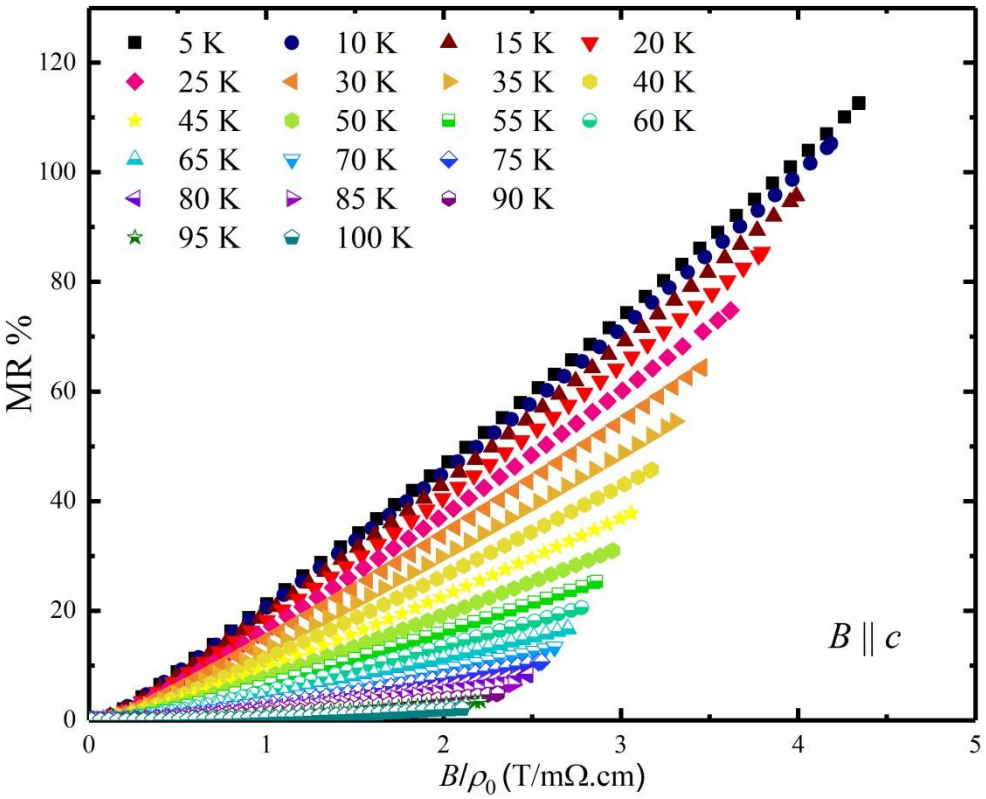
Method Name: 2024-Ca-Fe-As-2024.12.4
Analyst Name: admin
Acquire Date: 2024/12/4 10:31:57

Elem	Flags	Avg	Units
As1937		2.445	ppm
Ca3179		2.191	ppm
Fe2599		1.970	ppm

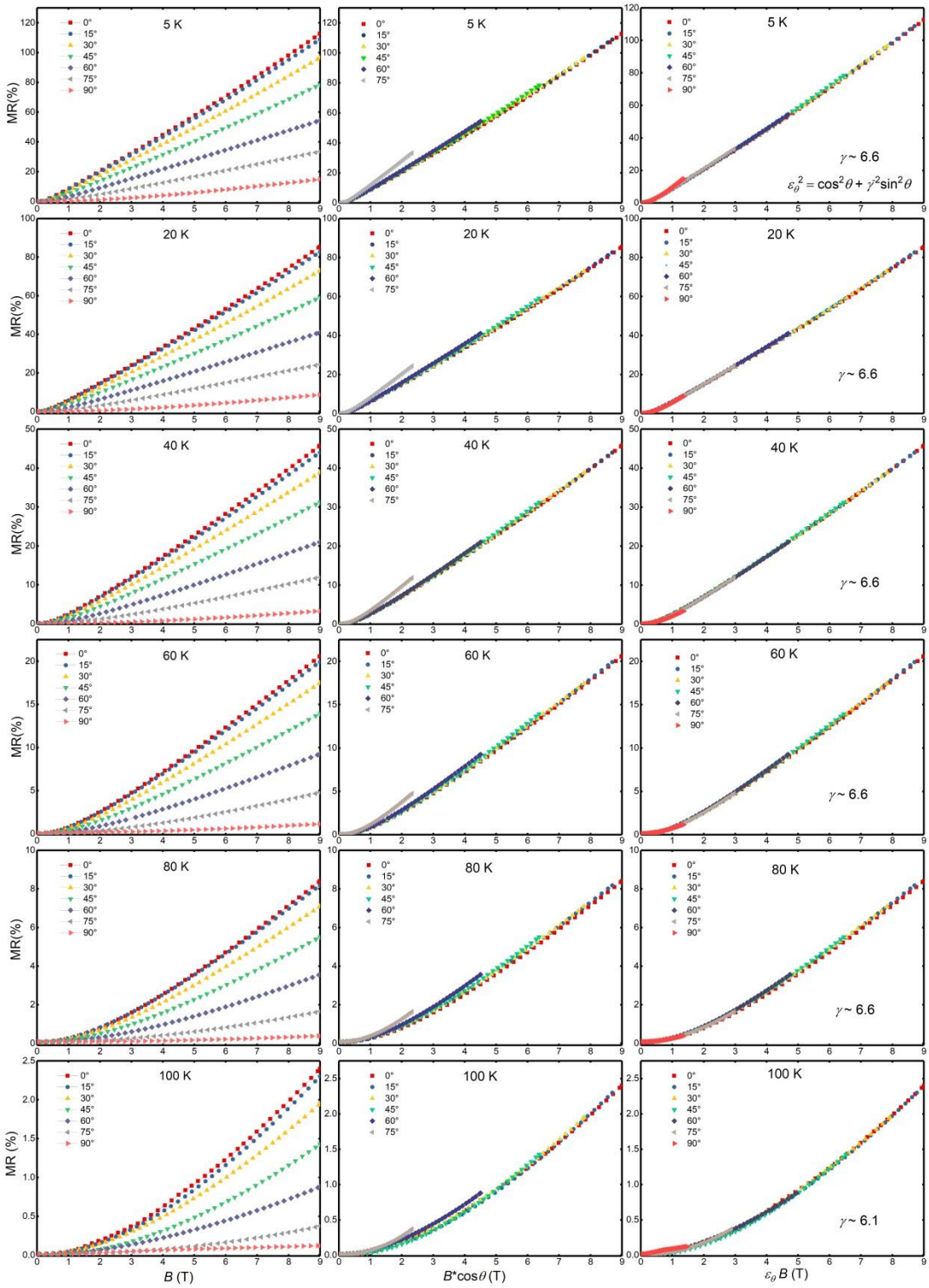
SFig. 1. The surface picture of CaFeAsF single crystal. The elements percentage measured by EDS are shown in Table. S1. The elements percentage proportion measured by ICP are shown in Table. S2.



SFig.2. The magnetic field dependent Hall conductivity at T = 3 K, 10 K, 13 K, 15 K, 17 K, 20 K, 25 K, 40 K, 60 K, 80 K, and 100 K. The fit results by two-band model and single-band model are plotted by red and purple solid curves, respectively.



SFig.3. The MR% scaled by Kohler rule with H/ρ_0.



SFig. 4. The magnetic field dependent, angle-scaled *B* dependent, and anisotropy-scaled *B* dependent MR% with angles θ = 0°, 15°, 30°, 45°, 60°, 75°, and 90°, which with temperatures at 5 K - 100 K.