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Physical properties of Rh substituted $CaFe_2As_2$ tuned by annealing/quenching[1] SHENG RAN, SERGEY BUD'KO, PAUL CANFIELD, Iowa State University, Ames Lab — Our previous work on $CaFe_2As_2$ single crystal grown out of FeAs flux has shown that a process of annealing and quenching can be used as an additional control parameter which can tune the ground state of $CaFe_2As_2$ systematically. We have also shown that $CaFe_2As_2$ is very pressure sensitive. Therefore, unlike the $BaFe_2As_2$ system, the effect of 4d transition metal substitution on $CaFe_2As_2$ is expected to be largely different from that of 3d transition metal substitution (e.g. cobalt or nickel substitution). In this talk we will present results of measurements on a Rh substituted $CaFe_2As_2$ system with different annealing/quenching temperatures. Phase diagrams with substitution level and annealing/quenching temperature as independent parameters are constructed and compared with that of other transition metal substitutions.

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