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Two-Gap Paring of the Optimal Doped (M,K)Fe_2As_2 with M = Ba, Sr FENGYAN WEI, Texas Center for Superconductivity at University of Houston and Department of Physics, BING LV, Texas Center for Superconductivity at University of Houston, FENG CHEN, YUYI XUE, Texas Center for Superconductivity at University of Houston and Department of Physics, CHINGWU CHU, Texas Center for Superconductivity at University of Houston and Department of Physics,Lawrence Berkeley National Laboratory — The gap structure revealed by the specific heat of iron pnictides remains unsettled. Not only do the reported characters vary for similar $Ba_{0.6}K_{0.4}Fe_2As_2$ and $Sr_{0.55}K_{0.45}Fe_2As_2$, single gap and two-gap pairings have also been suggested in the crystals with the same nominal composition of $Ba_{0.6}K_{0.4}Fe_2As_2$. It seems that either the gap structure is unusually sensitive to the sample details or some analysis procedures need to be refined Here we explored both the (Sr,K)Fe_2As_2 and (Ba,K)Fe_2As_2 systems, and different procedures were used to extract the phonon background. In the case of (Sr,K)Fe_2As_2, the phonon background seems to be insensitive to both the procedures and the potassium doping. For (Ba,K)Fe_2As_2, however, the data suggest a significant doping dependency of the soft phonons. The observations cast doubts on the previous procedures of using either $BaFe_2As_2$ or $Ba(Fe_{0.9}Co_{0.1})_2As_2$ to estimate the phonon background of $Ba_{0.6}K_{0.4}Fe_2As_2$. A new procedure, therefore, is developed. The result will be presented and discussed.

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