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Surface lattice dynamics of the 122-type iron pnictides[1] JING TENG, CHEN CHEN, GUORONG LI, AMAR KARKI, JIANDI ZHANG, RONGYING JIN, WARD PLUMMER, Louisiana State University — We present a systematic High Resolution Electron Energy Loss Spectra (HREELS) study of the surfaces lattice dynamics of the cleaved single crystals of the parent compounds AFe_2As_2 (A=Ba, Ca) as a function of temperature and sample treatment. The different phonon signatures on the competing surface reconstructions 1×2 phase and $(\sqrt{2}\text{x}\sqrt{2})\text{R}45^{\circ}$ phase are studied. For Ba there are two optical phonon modes are observed at 18 and 29 meV, which can be identified as the A_{1g} and B_{1g} vibrations of the As and Fe atoms, respectively. A detailed discussion is given in terms of the interplay between the spin and lattice in this novel system

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