The Influence of the Chemical Enviroment on the Lifetime of the Molecular-Field Split 2p Levels in H_2S

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The existence of variation in the lifetime of molecular field split 2p core levels in H_2S in shown theoretically and in experimental investigation of the Auger spectron spectrum. The measurements we performed for the transition of the 2p ionized molecules to the vibrationally resolved X^1A_1 state of H_2S. The lifetime of the $3e_{1/2}$ and $5e_{1/2}$ levels of the 2p ionized molecules are found to be 64 and 74 meV, respectively. The lifetime dependence is confirmed by ab initio calculations. A theoretical analysis shows that it results from the mutual orientation of the core-hole in the intermediate states and the valence electron density in the sulfur 3p orbitals. Both strongly influenced by the chemical bond. More detailed discussion will be given in the poster presentation