One reason that makes the study of the interaction of positrons with biomolecules interesting is the positron emission tomography (PET) technique. Studies by Robson et al. [R. E. Robson, M. J. Brunger, S. J. Buckman, G. García, Z. Lj. Petrović, and R. D. White, *Sci. Rep.* 5, (2015)] show the need to more accurately treat the structure of the medium in PET simulations, that is, as more than 60% of the human body is made up of water, it is important to know how positrons behave in this environment. Therefore our interest is to study the scattering of positrons by microsolvated systems. Based on the motivation presented, we chose for this study the formic acid molecule, since this plays an important role in the formation of large molecules, such as glycine and acetic acid. The microsolvation’s influence in the formic acid has been studied in the electron scattering [T. C. Freitas, K, Coutinho, M. T. do N. Varella, M. A. P. Lima, S. Canuto, and M. H. F. Bettega, *J. Chem. Phys.* 138 (2013)]. In this work, we report the integral cross sections for elastic collisions of low energy positrons with the HCOOH-·H$_2$O complexes. In the scattering calculations we employed the Schwinger Multichannel Method (SMC) [J. S. E. Germano and M. A. P. Lima, *Phys. Rev. A* 47 (1993)] in the static plus polarization (SP) approximation for energies ranging from 0.5 eV to 10 eV. We also include the contribution of the permanent electric dipole moment of the complexes through the Born-closure approximation. Formic acid has two stable isomers, namely cis and trans. In the calculations, we considered ten different structures hydrogen-bonded structures of HCOOH-·H$_2$O (being five isomers cis and others five trans) which were generated using classical Monte Carlo simulations [K. Coutinho and S. Canuto, *J. Chem. Phys.* 113 (2000)] of acid formic in water environment at room temperature. We also carried out calculation for the HCOOH (cis and trans) in gas phase for purpose of comparison with the complexes results.