

ABSTRACT

The invention relates to a technical field of increased permeability and anti-reflection of the surface of glass, in particular to a nano core-shell silica micro-sphere, a composite coating solution comprising the nano core-shell silica micro-sphere and a silica alumina sol, and the preparation methods thereof. A cationic polystyrene emulsion is used as a hard template to prepare the nano core-shell structured silica dispersion liquid in the present invention, which was composited with silicon aluminum sol to prepare an anti-reflective coating solution, and then tempered to obtain an anti-reflection film. The anti-reflection film with hollow structures is prepared by simple processes, and the raw materials used are easy to obtain. The holes are placed inside the particles instead of the network of silica dioxide, so as to ensure higher transmittance of reaching greater than 94.5%. The anti-reflection film has higher porosity and excellent dirt resistance performance. Moreover, it has high hardness by firmly attaching to the glass substrate. Due to the dense structure of surface which can prevent corrosion of water vapor, it has good weatherability and high industrial application value.