We report a two-step rapid route of synthesizing inexpensive mesoporous silica using the waste material (hexafluorosilicic acid, H_2SiF_6) of phosphate fertilizer industry and sodium silicate ($Na_2O{\cdot}SiO_2$). The reaction was performed in a newly innovated manufacturing apparatus. This apparatus produces mesoporous silica with uniform properties through controlled mixing of source materials at predetermined equivalent ratio. The precursors are rapidly mixed within the nozzles to enable uniform control of physical properties of the final product. The obtained mesoporous silica was characterized using N_2 physisorption studies, scanning electron microscope (SEM), and EDS. The final product was found to have superior properties that are suitable for green tire (environmentally friendly tire) as inorganic filler. The process reported in this study may significantly reduce the release of hazardous materials into the environment and it might confer economic benefits to the responsible industries. A project on innovative industrial application of our products for the tire industry is in progress.