A research performed by Iler in 1966 is the first study about directing the inorganic colloidal particles by electrostatic forces for the layer by layer deposition method. Iler proved that the multilayer structures were self assembled by dipping the material sequentially in oppositely charged two colloidal solutions containing silicate and alumina particles. In the early 1990s, Layer-by-Layer (LbL) deposition method was developed as a surface film coating technique by Decher’s group. LbL deposition method was firstly applied only for polymers, and then for nanoparticles and multivalent chemicals. LbL self assembly method includes sequentially dipping of the solid material in solutions composed of anionic and cationic molecules.

In this study, dyeing and finishing of cotton fabrics will be tried to be accomplished in one step by process of Layer-by-Layer deposition method. This method was performed firstly according to the dipping procedure. The biggest drawback of the dipping process is that it takes a long time in the adsorption of layers. In recent years, different methods were tried to be developed such as spraying, spinning and covalent binding. The spraying process needs special equipments and the dimensions of the materials are too small in spinning method. Covalent binding method can be applied in a limited number of groups of chemical substances. Therefore, applying of the multi-layer coating method to textile materials in a trade manner needs a new application principle. This project work covers the useability of a new nanofabrication method in which the dyeing and functional finishing processes can be applied in one step and at the same time in the textile industry in our country and abroad. In this study, as a new approach, layer by layer method will be applied on cotton fabrics by padding machine according to padding principle. By LbL deposition method, nano-sized and dye layers will be added to modified cotton fabrics surfaces for improving functional properties without making major changes in the weight, volume and comfort properties of the material.

Firstly, cationization process will be applied on 100% woven cotton fabric, to obtain cationic charges on the surface. For dyeing process, reactive and acid dyestuffs; for functional finishing process, TiO\textsubscript{2}, ZnO, Al\textsubscript{2}O\textsubscript{3} and halloysite nano clay nanoparticles will be used.

The research project will be carried out by an experienced team on the using of LbL method to give functional properties on cotton fabrics according to dipping procedure. In addition, since the research findings obtained from this study will also be feasible for other functional finishing processes in textile sector, this issue will contain important data to shed light on the new studies. Besides the academic level of the projects, it constitutes developing a new method for the textile industry and will be a reference for the direct application.
**Key Words:** Layer-by-layer deposition, dyeing, functional finishing processes