Glossary

**Acetolysis** – The breakdown of an organic compound using either acetic acid or acetic anhydride.

**Amphiphilic** – Relating to a molecule containing both hydrophobic and hydrophilic moieties.

**Anhydrobiosis** – The ability of an organism to undergo essentially yet reversible dehydration at some stage of its life history.

**Artificial Neural Network** – usually called neural network is a mathematical model or computational model that tries to simulate the structure and/or functional aspects of biological neural networks. It consists of an interconnected group of artificial neurons and processes the information using a connectionist approach to computations. They are usually used to model complex relationships between inputs and outputs or to find patterns in data.

**Autofluorescence** - self-induced fluorescence

**Columella** - Rod-like element of the ectexine supporting the tectum

**Control factor** – A design variable that is considered to influence the response and is included in the experiment. Its level can be controlled by the experiments.

**Design of experiments** – A systematic procedure to lay out the factors and conditions of an experiment. Taguchi employs special partial factorial arrangements (orthogonal arrays) to determine the optimum design.

**Diagenesis** – The process of physical chemical and biological modifications in deposited during its conversion to rock.

**Ectexine** - The outer part of the exine, which stains positively with basic fuchsin in optical microscopy and has higher electron density in conventionally prepared TEM, sections (Fægri, 1956).

**Encapsulation** – It is the condition of being enclosed, as in a capsule.

**Endexine** - The inner part of the exine which remains relatively unstained with basic fuchsin in optical microscopy and has a lower electron density in conventionally prepared TEM sections (Fægri, 1956).
Exine - The outer layer of the wall of a palynomorph, which is highly resistant to strong acids and bases, and is composed primarily of sporopollenin (Fritzsche, 1837).

Fenton type reaction – some metals have a strong catalytic power to generate highly reactive hydroxyl radicals. The reactions involving these metal generated hydroxyl radicals are Fenton type reactions.

Foot layer - The inner layer of the ektexine (Faegri, 1956).

Glass transition temperature – The temperature at which a liquid changes to an amorphous or glass solid.

Intine - The innermost of the major layers of the pollen grain wall underlying the exine and bordering the surface of the cytoplasm (Fritzsche, 1837).

Kubelka Munk Function - The concentration of an absorbing species can be determined using the Kubelka Munk formula:

Lumen - the space enclosed by muri.

Melting temperature – The temperature at which a substance changes from solid to liquid state.

Monodisperse – Characterized by particles of uniform size in a dispersed phase.

Muri - A ridge that is part of ornamentation and separates the lumina in a reticulate pollen grain.

Noise factor – Is a factor that has an influence over a response but cannot be controlled in actual applications.

Orthogonal Array (OA) – a set of tables used to determine the least number of experiments and their conditions. The word orthogonal means balanced.

Palynomorphs – Plant and animal structures of a size between 5 - 500µm found in rock (sedimentary) deposits.

Physisorption – Adsorption in which the forces involved are intermolecular rather than chemical.

Pollen kit – Is a material or fluid that is the result of the complete degradation of tapetum and rich in plastid-derived lipids and other pigmented compounds, covering the pollen grains, causing them to stick together to the anther or pollinator.
Porosimetry - It is an analytical technique used to determine various quantifiable aspects of a material's porous nature, such as pore diameter, total pore volume, surface area, and bulk and absolute densities.

S/N Ratio – stands for the signal to noise ratio i.e. the ratio of the power of signal to the power of noise (error). A high S/N ratio will mean that there is high sensitivity with the least error of measurement. In Taguchi analysis S/N ratios, a higher value is always desirable regardless of the quality characteristics.

Sporopollenin - The name given to the acetolysis resistant biopolymer which make up most of the material of the exine (Zetzsche, et al., 1931a).

Spray freeze drying – Method which combines processing steps common to freeze drying and spray drying.

Taguchi method - A quality engineering methodology developed by Genichi Taguchi that includes off-line quality control, on-line quality control, and system of experimental design to reduce costs and improve quality. Taguchi methods are not just a statistical application of design of experiments. Taguchi methods include the integration of statistical design of experiments into a powerful engineering process. The goal is not just to optimize an arbitrary objective function, but also to reduce the sensitivity of engineering designs to uncontrollable factors or noise. This moves design targets toward the middle of the design space so that external variation affects the behavior of the design as little as possible. This permits large reductions in both part and assembly tolerances, which are major drivers of manufacturing cost.

Transformation efficiency – It is a measure of the amount of cells within the bacterial culture that are able to take up DNA molecules.

Viscin threads – Very fine threads of tapetal origin made up of sporopollenin, attaching to the exine of pollen grains causing them to clump together.

Zeta potential (ζ) - It is the electrostatic potential near the surface of a particle