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A piece of solid or liquid matter is necessarily bounded by surfaces of contact with vacuum or atmosphere, or by interfaces on contact with another piece of solid or liquid matter. The mere existence of surface or interface can modify the properties of a material interacts with the outside world. Thus many practical uses of materials depend on the state of their surface and their surface properties.

All solid substances are known to be capable of attracting molecules of gases or solutions to their surface with which they are in contact. This phenomenon is known as ADSORPTION. In other words ADSORPTION is a kind of adhesion which takes place at the surface of a solid or liquid in contact with another medium, resulting in an accumulation or increased concentration of molecules from that medium in the immediate vicinity of the surface. The solids that are used to adsorb gases or dissolved substances are called ADSORBENTS and the adsorbed molecules are usually referred to collectively as ADSORBATES. When solid substance is dissolved in liquid to form solution, the solute usually tends to concentrate either on the
surface or in the bulk of the solvent. For example, soap solution (positive adsorption). On the other hand, inorganic salts such as ordinary table salt tends to concentrate in the bulk of aqueous solution rather than in its surface (negative adsorption).

The outsider materials penetrating the bulk of the substances leads to phenomenon of ABSORPTION. The distinction between ADSORPTION and ABSORPTION is not clear-cut, the non-committal word SORPTION is sometimes used. The process that will be considered in this study will be surface effects and the word adsorption will be used.

There are essentially three consecutive stages associated with the adsorption of materials from solutions by porous adsorbents (1):- the first step is the transport of the adsorbate to the exterior surface of the adsorbent; the second step is the diffusion of the adsorbate into the pores of the adsorbent; and the third step is the adsorption of solute on the interior surface of adsorbent.
At a fixed temperature, there is a definite relation between the number of molecules adsorbed on a surface and the pressure (if a gas) or the concentration (if a solution). The degree of adsorption depends upon five factors [2]:

i. The composition of the adsorbing material.

ii. The condition of surface of the adsorbing material.

iii. The material to be adsorbed.

iv. The temperature.

v. The pressure (if gas)

Traditional applications of physical adsorption include the use of Charcoal for removing poisonous gases from air; hydrocarbons from natural gas; oxygen, nitrogen or other gaseous impurities from helium during the separation and purification of the later. The adsorption of solute on the surface of solid in contact with solution is of fairly common occurrence. Adsorption from solution has been of more applications than that of gas phase. Its importance in dyeing, photography, brewing, the purification of water, the clarification of oil and in making lubricants more effective is well known. Soil and soil colloids with their large surface area (30 to 50 ac. per pound) are able by adsorption to remove from solution and
retain fertilizer components essential to plant growth [3]. Adsorption operations are used to remove impurities from liquids. Applications of adsorption from solutions on solid adsorbents have been considerably developed and become very important in many fields such as in purification process, water treatment process and analytical method [4]. For generations, it has been known that adsorption provides an effective method for removing organic solutes from dilute aqueous solutions.

In recent years, in order to reduce environmental pollution, there has been an escalating interest in multicomponent adsorption for cleaning industrial waste waters. Municipal and industrial waste water including organic compounds are sources of environmental pollution. Various adsorbents are useful in the removal of organic compounds and the regeneration of the water [5]. Many industries in India presently discharge untreated water on land or in natural streams causing pollution of surface water, ground water and land. As a result of rapid industrialisation, the water resources development schemes and water distribution systems, are unable to keep pace with its increased demand. The reclamation of water for industrial reuse would minimise both these problems.
The emphasis is placed on the use of synthetic resins as adsorbents and on their performance relative to activated carbon for waste containing high concentrations of detergent or water containing a heterogeneous mixture of organic compounds such as domestic waste water or effluent from a secondary biological plant treating domestic sewage. The weak base resin seems to function best [6]. Activated carbons have usually been used as the adsorbents of waste water treatment [7-11]. Adsorption by activated carbon has also been emerged as most efficient and economical process for removing undesirable organic materials from aqueous solutions [12-14]. The removal of pollutants from aqueous effluents by adsorption on solid, produces high quality treated waste water. Many adsorbent materials have been tested [15-17].

Solid adsorbents, used industrially include active alumina, alumina impregnated with calcium chloride, activated bauxite, fuller's earth, silica gel, shell-base carbon, petroleum-base carbon and anhydrous calcium sulphate. Charcoals, carbon blacks, clays, earths, activated alumina or bauxite or other materials of highly adsorbent character are used to remove
undesirable colours (and often odors) from sugar, vegetables, animal faeces and oils, among other substances. In a broad sense, decolorizing agents also embrace bleachings, which usually involve chemical reactions for removing colours. The adsorption behaviour of some anionic dyes used in textile industries, on newer synthesised adsorbents from gum gum has been studied and trimethyl aminised derivatives was found to be better adsorbents for the removal of colours of textile effluent in both alkaline and acidic conditions [18].

In view of high cost of adsorbents, there is a continuing search for low cost efficient adsorbents [18–22]. Adsorption capacity of five natural adsorbents namely chitin, chitosan and scales of three different species of fish: progy, flounder and cod has been studied [23]. Chitosan has been put to many uses as adsorbent [24]. Chitosan derived from Prawn shell waste, shows specific adsorption capacity [25]. The particles of calcium carbonate may contribute surface area for anion adsorption [26].

The world is bestowed with vast natural resources. Two-third of its geographical area is covered by sea and ocean water and the remaining one-third land too, has a large number of rivers,
lakes, tanks and ponds. Innumerable aquatic animals of invertebrate phylum Mollusca (one of the largest and most important division of the animal kingdom) range in size from snails, little larger than a grain of sand to giant squids measuring more than 60 feet from the tip of the extended arms to the end of the tail. The phylum comprises six classes containing more than 1,00,000 living species and even greater number of fossil forms. All mollusks have a mantle and most have a shell in the adult stage. Although the mantle secretes the shell, it is not attached to it except at a single point or a few points, depending on the group of the animals. The shell is composed of mineral salts, mainly clacium carbonate with traces of calcium phosphate, magnesium carbonate, silica and organic matter [27,28].

Mollusks have always been of great interest and importance to man because of their use as food, tools, utensils, ornaments, money or religious emblems, by primitive man. They are an aid to anthropologists in tracing the trade routes of primitive people who fed on the animals and used the shells as money shells, are also of interest to collectors and are an important part of the tourists trade in some sea side areas. They are also important to oil
geologist and paleontologist as index fossils and are one of the organisms most often used in carbon dating[29].

Unio & Pila are the prominent animals of phylum mollusca [30]. They are common aquatic animals, found in plenty, in and around the rivers, ponds, tanks, lakes, marshes & paddy fields. Their precious hard protective shells, left by them, are also found in abundance, in and around the water. Keeping in view the easy availability of desired amounts of the shells, it was thought worthwhile to employ the shells of Unio and Pila as adsorbents in the present study.