

## French Green & Pink Clays Research Paper

### APPEARS INS



French Green and Pink Clays absorb and remove impurities, leaving the skin fresh and rejuvenated. Modern technology has been able to utilize the beneficial properties of clay in personal care products such as facial creams, sunscreen, cleansers, shampoos, and makeup items. The most common use of French Green/Pink Clay is via mask. This can be found in the [Three Ships Detox Antioxidant Clay Mask](#) which has the French Green Clay, and [Three Ships Soothe Rosehip Vitamin C Clay Mask](#) which has the French Pink Clay

### MODERN TECHNOLOGY HAS BEEN ABLE TO UTILIZE THE BENEFICIAL PROPERTIES OF CLAY IN COSMECEUTICALS

Formed as a result of volcanic ash and sediment, the French Green and Pink Clays that Three Ships sources are naturally occurring, mineral-rich elements derived from France. The French Green Clay is essentially illite and the clay contains components such as iron, silica, aluminum, and calcium. French Pink Clay is illite/kaolin, where kaolin is a white clay.

The colour of the Green Clay comes from the oxides present in the minerals and the Pink Clay comes together through the combination of red and white clays. French Green Clay works to remove impurities, tighten pores, and firm the skin, while French Pink Clay is a milder clay, suitable for sensitive skin, that works to cleanse and remove dead skin cells.



Traditionally, French Green/Pink Clay is prepared by a process of sun-drying and crushing. After the clay has been mined, it is spread in the sun to remove excess water. It is then ground by large hydraulic crushers and micronized, or finely pulverized. The last stage in the process is a final sun-drying to remove the last traces of water. Removing the water ensures that no microbes or bacteria contaminate the clay and cause an unwanted reaction. The exact process of extraction method for the French Clay powders that Three Ships sources is proprietary information.

There are two structural types of clay minerals. The structural configuration is either 1:1 or 2:1 and, while the composition of the clay minerals may be the same, different physical properties can be observed if the configuration is different. The 1:1 structure refers to the arrangement of one tetrahedral silica sheet bound to another octahedral aluminum sheet, and the 2:1 structure refers to the arrangement of one octahedral sheet between two tetrahedral sheets. Clay minerals of 1:1, and most of 2:1 structures like French Green Clay, do not swell when in contact with water. French Green Clay's structure is 2:1, consisting of one octahedral aluminum sheet between two tetrahedral silica sheets. This composition allows for more surface area and multiple ion substitutions in each sheet, giving it a higher cation exchange capacity.

Cation exchange capacity is the amount of positive charge that can be exchanged per mass of clay. It is attributed to the various negative charges in the clay minerals and the layered sheets of aluminum and silicon oxides. The exchange happens when the positive-charged ions from minerals in the clay are replaced by other elements with lower positive charge. In theory, those elements with lower positive charge are sourced from enviro-toxins like oxidants and sometimes bacteria and viruses, depending on how long it's left on the skin for.

Clays also have the ability to be absorptive and adsorptive. A clay's absorption is what allows it to draw oil from our skin and it is referred to as its ability to attract elements into itself. A clay's adsorption refers to its ability to attract elements onto its surface. To differentiate, absorptive clay applied to the skin will draw oils, impurities, and toxins out from the skin and into itself, whereas an adsorptive clay will draw impurities out from the skin and keep them suspended on its surface.

## SCIENTIFIC STUDY

### Antibacterial Study on French Green Clay

Researchers have studied the antibacterial properties of two different samples of French Green Clay and their effects on a broad spectrum of bacteria. Of these two clay samples, one of them inhibited the growth of bacteria and the other showed results of promoting bacterial growth after 24 hours. Overall, the conclusion made from this study was that the chemistry of the clay, and the surface properties that affect pH and oxidation state control the chemistry of the water used to moisten the clay particles and contribute the critical antibacterial agent(s) that ultimately debilitate the bacteria. Being mindful of these results, the Detox/Soothe Clay Masks were made to be in powder form without pre-moistening the mask in the jar to increase shelf-life and prevent bacteria growth from occurring.

Clay minerals have a wide variety of applications in many industries and are particularly important in the development of pharmaceutical and dermo-cosmetic formulations for several reasons. The unique properties of French Green/Pink Clay makes it an attractive ingredient for natural cosmetics and skincare. Its absorption capabilities and ion-exchange capacity allow it to be great at attracting oils and debris to enhance or even change certain properties needed for specific applications such as clay masks, shampoos, and makeup.