

## **DIRECT INCORPORATE OF CLOVE OIL VS ENCAPSULATED CLOVE OIL FILMS FOR ORAL CARE FORMULATION**

Actifilms™ AF is made up of Hydroxypropyl Methyl Cellulose which is a chemically modified cellulose polymer. HPMC is a water soluble synthetic polymer which was used as film former. It is a thin, flexible sheet of polymer in which an active ingredient has been incorporated. Films are rapidly disintegrate and also have greater stability and shelf life.

### **BENEFITS OF CLOVE OIL:**

- Clove oil Contain Eugenol has anti-inflammatory properties which relief from toothache. It can numb the part of the skin that is in close contact with the teeth.
- Clove oil has antibacterial properties to help in resisting the bad bacteria and cleanse the mouth and help freshen breath.
- Clove oil has anti-inflammatory properties it can help to reduce the gum swelling and enhancing the gum tissue health.
- Clove oil as an antimicrobial activity to help the kill bacteria.

### **WHY ENCAPSULATED CLOVE OIL ?**

Encapsulation Technology used in the development of formulations that more stable, more effective and with improved sensory properties. Clove oil is a volatile compound and its sensory properties can be change due to volatilization, heating or chemical interaction, which will alter the quality of the product. Clove oil is essential oil which can be degrading during processing, storage and transformation. These all problems can minimize by the encapsulation of Clove oil.

### **UNIQUE FUNCTIONS:**

- Easy to handle at the industrial scale.
- Disappear on gentle rubbing without leaving any residue on teeth / oral case use upon application.
- Non toxic and Non irritant ,soluble in water. Available in natural flavors.
- Available in different shapes & color
- Film have more flexibility and better physical properties.

### **MANUFACTURING PROCESS OF ACTIFILMS™CONTAINING CLOVE OIL:**

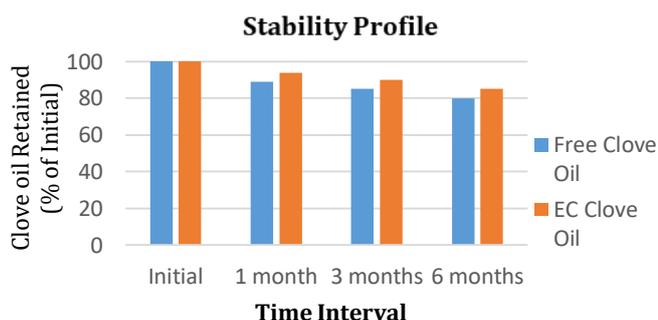
The Solution Casting method: It is ideally suited for a water-soluble polymer, “Water soluble” refers to a film which, when exposed to water, begins to dissolve or disintegrate to its smallest components. Film coating is the process whereby active material is surrounded by a thin layer of polymeric material. Film coating method generally involves the steps of continuously pumping a feed of polymer solution with primary component i.e. HPMC. Both HPMC and colour



weighed accurately and mixing of all ingredients to achieve homogeneous primary solution and further combining with secondary component to polymer solution. Secondary components such as active functional or decorative ingredients are finally deposited into the primary solution onto the casting surface for film formation using Umang Pharmatech's UCFC-600 (Solution tank, Film Casting). The resulting solution is cast as a film and allowed to dry, which are then cut into pieces of the desired size and shape.

### IMPROVED SHELF LIFE STUDY:

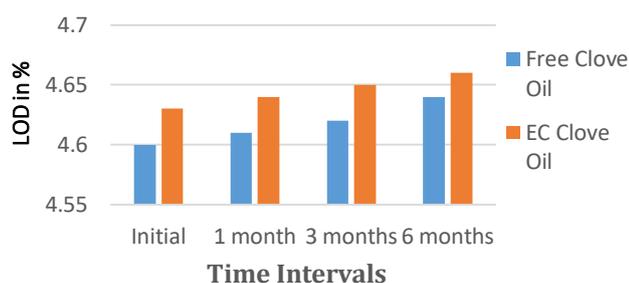
The Free Clove oil and Actifilms™ containing Clove Oil were kept in an air tight glass bottle and place in Stability Chambers at temperatures of 30°C ± 2°C for 180 days, HPLC analysis show that the Actifilms™ containing Clove Oil retain 85 % of the Clove oil while the free clove oil only retained 80 %.



### TEMPERATURE EFFECT ON LOD STABILITY:

The Free Clove oil and Actifilms™ containing Clove Oil were place in an air tight glass bottles at 30°C ± 2°C for 180 days in a stability chamber. The sampling and analysis was done at fixed time intervals for their LOD, to check the moisture loss in the samples. Results mentioned in below graph.

#### Effect of Loss on Drying on Stability



### CONCLUSION:

The results obtained from this study show that using encapsulated are more stable and deliver desire amount of dose of clove oil and make it an ideal for use in oral care formulation.

### REFERENCES:

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### KEY WORDS:

Encapsulated films, Films for special effects ,HPMC films, dissolving Films