## **Supporting Information**

## Materials

Phosphoric acid (99% purity), Methanol (99% purity) and sodium hydroxide (98%) were purchased from Fisher scientific Company. Dairy waste scum was collected from Tumakuru Milk Union (TMU), Tumakuru. Fresh dairy waste scum oil was collected to avoid higher free fatty acid and biological action. Then heated at 100 °C to convert liquid form and kept in a settle tank for 20 minutes. The dairy waste scum oil was collected and remaining waste materials are removed. The separated oil is then centrifuged and filtered to remove semi solid particles present in the liquid. The purified dairy scum oil is used for transesterification reaction.

## Quality analysis and characterization of sodium phosphate

The characteristic properties such as matter insoluble in water, phosphates, heavy metals (Pb) and assay of synthesized sodium phosphate was analysed according to IS 573: 1992. Powder X-ray diffraction (XRD) was performed by Rigaku smartlab X-ray diffractometer using Cu-K<sub> $\alpha$ </sub> radiation (1.5406 Å) over a 2 $\theta$  range of 10-80° with a step size of 0.02°. Zeiss EVOLS-15 scanning electron microscope (SEM) was used to study the surface morphological features of produced catalyst.

## **Kinetic study**



**Fig. S1.** Plot of (a) -ln[1-x] v/s t for kinetic study of transesterification



Fig. S2.  $\ln k$  v/s 1/T for kinetic study of transesterification reaction