Researchers at the University of South Florida have invented a method for a longer lasting and more uniform self-heating chemical system with applications in a wide range of fields.

There is a portfolio of self-heating products emerging in a market expected to gross five billion dollars annually. These product areas include food, beverages, clothing and medical products. There are a number of key issues that are only partially addressed by the various products currently on the market. These include: the initiation and control of these reactions, retention and distribution of heat, and handling of materials.

This present invention combines heating through chemical reactions with the use of phase change materials in order to provide more uniform temperature and more extended heating times. The initial heat released during reaction is utilized for immediate initial heating of the system and then to melt the phase change material that it placed adjacent to the pouch where the chemical reaction takes place. Subsequently, the phase change material solidifies at a constant temperature providing heat for prolonged durations. This also helps to tune the temperature of the commodity based on the requirement of the customer. This invention addresses the aforementioned key issues in an inexpensive, simple, safe and environmentally conscious fashion.

**ADVANTAGES:**
- Sustained temperature for longer durations
- Inexpensive, simple, and safe

**Combines Chemical Reactions with Phase Change Materials**

**Temperature Profile Obtained with the Calcium Oxide - Paraffin System**

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