However, under the operating conditions, the injection of these fluids generates highly corrosive environments that have an impact on the deterioration of the materials, resulting in risks and operational costs. Therefore, it is necessary to determine the theoretical corrosion products that can be generated in these processes.

This research focused on the study of API N-80 carbon steel exposed to a steam and flue gas atmosphere, at pressure and temperature conditions in the ranges of: 800…1100 psia (55…75 bar) and 520…560 °F (270…290 °C) respectively. Based on this environment, in order to determine the theoretical corrosion products, a thermodynamic simulation stage was developed using HSC Chemistry software, which was used to generate Pourbaix, Ellingham and thermodynamic equilibrium diagrams. It was found that the main theoretical corrosion products corresponded to oxides, carbonates and hydroxides, among which the significant presence of iron (III) oxide (Fe_2O_3), iron (II, III) oxide (Fe_3O_4) and iron carbonate (II) ($FeCO_3$) was corroborated.

PHYSICAL AND THERMAL CHARACTERIZATION OF LOCAL GREEN RENEWABLE RESOURCES FOR IMPROVEMENT OF THERMAL ENERGY STORAGE SYSTEMS

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Fossil fuels and wood are still the main alternative for supplying energy needs for heating in many rural areas of the South American Andean region. In addition to environmental pollution problems in these high mountain areas, the use of these fuels leads to long-term health problems for the communities, many of them related to respiratory disease.

Despite low temperatures, these high mountain areas are exposed to high levels of solar irradiation during the day. This makes it possible to consider the use of solar thermal energy storage systems (STESS) as an alternative for fulfilling thermal energy needs. STESS are commonly designed using storage cells which contain heat accumulating

materials. Latent heat storage is preferred over sensible heat storage, so these materials, known as phase change materials (PCM), must have some desired features such as suitable melting temperature, high melting enthalpy, good thermal conductivity, chemical stability, and fully reversible fusion-solidification processes. Although in recent years progress has been made in the design of these units, the variety of PCM used is still limited and most are designed based on petroleum paraffin waxes.

Despite the technical advantages of paraffin waxes, the development of green substitute materials has been pursued in recent years. The present work aims to characterise and assess the convenience of different materials of agro-industrial origin such as vegetable oils and fats, waxes, sugar alcohols and fatty alcohols, produced in the Andean Region. Data obtained for melting temperatures, melting enthalpies, composition, heat capacities, density, toxicity, price, and annual production was considered for the evaluation of the potential as heat storage materials. This work contributed to the identification of renewable, economical, and technically feasible materials with the potential for heat storage while contributing to both environmental protection and the development of local economies.

КОМПЬЮТЕРНОЕ МОДЕЛИРОВАНИЕ ПРОЦЕССОВ АГРЕГАЦИИ В ТРУБЧАТЫХ И ПРОТОЧНЫХ РЕАКТОРАХ

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COMPUTER SIMULATION OF AGGREGATION PROCESSES IN BATCH AND FLOW REACTORS

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Для описания агрегации в неоднородной полидисперсной среде был применен новый подход к моделированию агрегации кластеров, основанный на парадигме моделирования дискретных событий (DES) с помощью случайного блуждания частиц и агрегации на трехмерных стохастических решетках,. Представленный подход позволяет учитывать различную иерархию случайных времен дрейфа частиц и времен агрегирования кластеров разного порядка в разных областях рабочего объема аппарата.

Ключевые слова: *моделирование агрегации кластеров, парадигма моделирования дискретных событий, полидисперсная среда*