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Proceedings

The Public Establishment for Industrial Estates
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Public Establishment For Industrial Estates

Caledonian College of Engineering
University College

Caledonian College of Engineering
A University College in Oman

are optimized. Effect of initial concentration of compounds on degradation kinetics is also investigated. Up to 75% degradation was achieved in a total reaction time period of 10hrs corresponding to Laterite iron: H2O2 ratio of 1: 50 at a pH of 3 for a mixture containing both compounds at 10mg/L each. Use of iron in Fenton's oxidation process harnessed from the laterite soil can be a suitable alternative to treat polluted water bodies contaminated with pharmaceutical halopyridine compounds.

Commonality and Difference in Intercepting of Solar Radiation by Flat Panels and 3-D Anthills: Lessons for Engineers

Kasimova R G [1], Tishin D [2], Obnosov Yu V [3], Kacimov A R [4]

[1] *German University of Technology in Oman,*

[2] *Department of Ecology, Kazan Federal University, Russia,*

[3] *Department of Differential Equations, Kazan Federal University, Russia,*

[4] *Department of Soils, Water and Agricultural Engineering, Sultan Qaboos University, Oman*

The ant-termite mounds, ATM, are structures constructed by social insects, with an intricate juxtaposition of: a)"Smart" thermophysical properties of the material of the ATM walls, b) Ability of the whole structure to intercept the incident solar radiation, generation of the in-nest heat and maintaining biologically ideal (about 25-30 C) temperature in the interior. We present experimental results and a mathematical model of optimization of ATM, which captures radiation through a segment (cone frustum). Measurements of the total solar energy by a pyranometer placed on slopes of ATM at different azimuthal and tilt angles with simultaneous measurements of temperature by thermocouples inside the nest are presented. We use a standard methodology to calculate the direct and diffuse radiation. ATMs, as dwelling-shelter entities, are paraboloidal, conical, hemi-spheroidal, cathedral-shaped, etc. whose incident angle of Sun beams is spatially nonuniform. Consequently, integration of the incoming energy flux is carried out with the angle of the normal to the surface and the so-called second fundamental form, both changing from one point to another. Optimal shapes of ATM are explicitly presented for given climatological conditions.