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The Development of Electrical Heating Mortar by Using MWCNT

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Natural gas has limited reserves. The installation of a central heating requires a furnace, water pipes and radiators which is labor intensive, costly and time consuming. Besides natural gas and coal, central heating system uses electricity also to pump water. In the life time of the structure, the service, repair costs of central heating are great. In this study, “Electrical heating mortar-building” (EHMB) will be manufactured to heat buildings. EHMB will be used in places without electricity (military and police stations, borders, villages with solar panels and wind turbines), in cities in official buildings (schools, hospitals, universities etc.) and other buildings to heat. Installation, service costs will be much lower than central heating system. EHMB will be a safe, cheap, comfortable and reliable heating system. Methodology: Mortars with the addition of different Multi-Wall Carbon Nanotube (MWCNT) dosages (0,11 0,23 0,35 by volume %) were designed. The mortars also had constant amount of 1% volume of brass fiber. Prismatic samples which had dimensions of 5*5*2,5 cm were cast with electrodes on both ends. Electrical heating tests were conducted and temperature was measured. Conclusion & Significance: The mortar having higher amount of MWCNT had a higher heating rate and maximum temperature. The results show that this mortar can function as a heating element in heating buildings. As a result, buildings are designed with this mixture and solar cells, it is possible to build a smart and environmentally (green) building

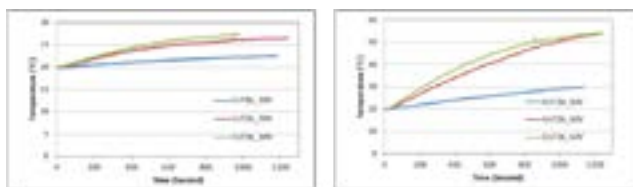


Figure 9 Temperature-time graphs during the heating tests (a) Under 30V (b) Under 60V

Biography

Adar Karagöz, MSc in nanotechnology and worked on the thermal efficiency of conductive materials in concrete. This work creates new ways to protect nature with renewable energy and to design intelligent green buildings. This model will be designed both for buildings and for icy roads in winter. This work has been developed to protect nature and to provide permanent solutions to problems.

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