

ABSTRACT

Title of the Document: DESIGN AND DEVELOPMENT OF
POTASSIUM FORMATE BASED ATMOSPHERIC
WATER HARVESTER

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With the deteriorating climate and rapid depletion of natural resources, the problem of water scarcity is on the rise and there is a pressing need for sustainable technologies to address this problem. The extraction of water from air has been identified as a potential solution to address the water scarcity problem in arid regions that do not have ready access to seawater. Much of the research in the literature in tackling this problem has been focused on the use of heat pumps and the use of Atmospheric Water Harvesters (AWH) via solid desiccant technologies. Very little work has been done on utilizing the potential of liquid desiccants for the extraction of water using potassium formate. Through this thesis, we have designed and developed a novel and low-cost AWH utilizing (i) an aqueous solution of potassium formate as the medium for absorption of moisture during the night when the relative humidity is high and (ii) solar energy for removal of absorbed moisture from the desiccant solution during the day. The design has been experimentally validated.