Alternative Energy

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Table of Contents

Chapter 23

Developments on Solar Operated Water Desalination

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Abstract

Various designs of solar stills ranging from minimal to technically advanced have been overviewed. Solar thermal systems that produce potable water from salty water have been studied for the last five years. The limitations of some types of solar stills have been pointed out. The multistage evacuated solar still was found to be of better output rate than the normal multistage systems. There is a great need to improve the design in order to utilise the multistage evacuated solar still concept.

Keywords: desalination, solar, stills, multistage,

INTRODUCTION

Water will probably become the most critical natural resource issue facing most parts of the world by the start of the next century. By 2025 at least sixty-five nations will experience serious water shortages. Water is likely to figure as a national security issue for many countries in the twenty-first century. Lack of water can have profound economic and military consequences. There are large desert/or arid areas while an infinite water resource of seawater is available on the earth. We definitely need to produce fresh water from seawater in the 21st century by using much larger scale systems than those in the present century.

Distillation is a process of water purification that uses heat energy to evaporate water and collect the Condensate as pure water, which makes it very costly for developing countries, which originally suffers from a huge energy shortage. Desalination plants usually use fossil energy. All types of air pollution associated with energy production. Solar still, in many respects, might be an ideal source of fresh water for both drinking and agriculture; it is one of the important and technically viable applications of solar energy. Solar distillation has a very old history which extends back to about 2000 years ago, where it was used originally to produce salt rather than pure water. The first large size solar still was built in 1872 to supply the mining community in Chile with fresh water. There are approximately 11,000 desalination plants in 120 nations in the world, 60 percent of them in the Middle East. The first modern plant was built in Saudi Arabia in 1938, although two small experimental plants had been built earlier in the same country and two existed before (in Japan and Egypt).