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THE FLAME THAT COOLS: ABSORPTION COOLING

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Abstract- *The severity of the ozone layer destruction problem, due partly to CFCs and HCFCs, has been calling for rapid development in Freon-free air conditioning technologies. With regard to energy use, global warming prevention requires a thorough revision of energy utilisation practices towards greater efficiency. From this perspective, absorption cooling research has drawn the attention of many investigators, as it does not use ozone depleting substances as refrigerants as well as it can minimise the use of fossil fuels produced electricity.*

With these considerations in mind, the vapour absorption cooling system based on aqueous lithium bromide solution as the working fluid has been investigated. The investigations carried out falls into three main aspects: theoretically, economically and experimentally.

Some of the main advantages of the vapor absorption cycle over the vapor compression cycle are:

- *The primary energy input is in the form of heat instead of electricity. This input heat energy could be energy from the burning of fuels, waste heat from other processes, solar energy and many more. This provides an opportunity to couple the vapor absorption system with various novel energy-saving strategies.*
- *No large moving parts. The absorption system gets rid of the compressor, which is easily the most failure-prone component of the vapor compression system.*

This leads to a significant reduction in maintenance costs and down-time of the system.

- *Vapor absorption systems use environmentally friendly working fluids such as water, ammonia and lithium bromide, instead of chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs) that are frequently used in vapor compression systems. These absorption system working fluids have zero ozone depletion potential (ODP) and global warming potential (GWP).*