ABSTRACT

For this project I designed a refrigeration system, which was built to simulate the operation of a Crosley IcyBall. This unit utilizes ammonia and water in an absorption cycle. After constructing the system I charged it with anhydrous ammonia and water. Anhydrous ammonia can be very deadly if not handled properly and charging the system took much time to organize because of the liability issues. The danger of ammonia was a leading factor in the industry wide change to vapor-compression systems. My system does not circulate the refrigerant through the cycle. The refrigerant must be transferred from one side of the unit to the other by manually over turning the unit. This made it very difficult to get any water into the cold tank were it could absorb the ammonia. Therefore the system did not operate as planned.

It was determined that the amount of refrigerant and absorbent used was too little for a system of this volume. The flow rate though the cold side of the system was not fast enough to cause a pressure drop, which is what I intended on. The desired outcome was never realized however, the cold tank did reach a temperature as low as 21°F during the initial mixing.
The test setup can be seen in Figure 7.

Figure 7: Set-up of System