THERMAL CONDUCTIVITY FOR THE CO2+R1234YF AND CO2+R1234ZE(Z) BINARY GASEOUS MIXTURES AT LOW PRESSURE

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Chlorofluorocarbons (CFCs) have been phased out under Montreal Protocol of 1987 as a result of ozone depleting potential (ODP). Carbon dioxide owing to the environmental benefits zero ODP, low global warming potential (GWP), no flammability was expected to replace the principal classes of refrigerants. The use of CO2 may require a total redesign of refrigeration units. Hydrofluoroolefins (HFOs) especially R1234yf and R1234ze(Z) has recently proposed as hew generation alternative refrigerants. Because of their mildly flammability the mixing of CO2 and HFOs may offer a good alternative to meet the requirement of high cycle efficiency and not dangerous for human beings. A representation for the thermal conductivity of the mixtures of CO2 and HFOs at atmospheric pressure is developed. The thermal conductivity concerning the mixtures was estimated by Sutherland equation type and by Wassiljeva relation modified by Lindsey and Bromley. To apply this procedure the viscosity and thermal conductivity of pure HFCs substances were established. To obtain these properties the theoretical approach by Mason, Monchick, Filippov and Golubev were used. The data were obtained at temperatures from 250 K to 360 K. The proposed technique was checked by the comparison with the experi-mental thermal conductivity data for the binary mixtures of R134a and R32 and for the triple zeotrop R407C. The agreement is satisfactory.