Alternative refrigerants to replace R410A for residential air conditioning

Dr. MD Kutub Uddin
Post-Doctoral Research Associate
Research Center for Next Generation Refrigerant Properties (NEXT-RP)
International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University,

Due to the growing international emphasis on global warming mitigation, the refrigeration industry began to look for a new refrigerant in approximately 2001. Refrigerant industry mostly used HCFCs and HFCs for heat pump application but it has ozone depletion potential (ODP) and high global warming potential (GWP). So, the next generation refrigerant is considering being free of ODP and GWP. The development work to shift to a new low GWP refrigerant in many laboratories got momentum after European Union MAC Directives which requires GWP<150 for mobile air conditioner and for GWP<750 for residential air conditioner. Many refrigerants and their blends are chosen primarily for study. Flammability, toxicity, volumetric capacity and temperature glide are factors that limit the choice of any new refrigerant. Our study focuses the cycle performance of new refrigerant mixtures which can replace the R410A used in residential air conditioning.