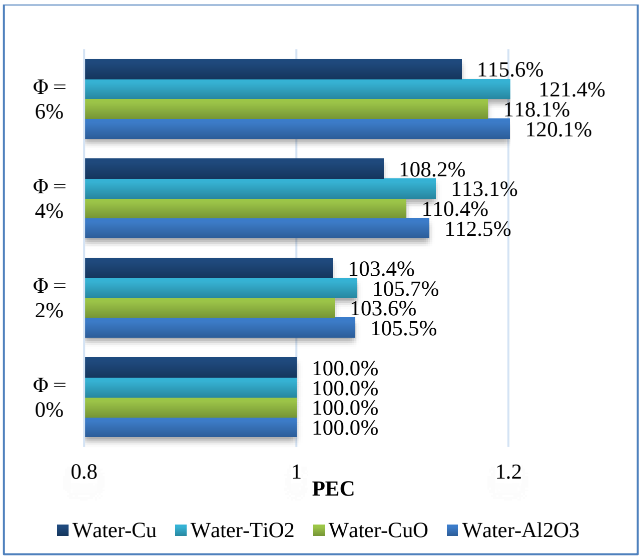

Fig. 9. The (PEC) of various nanofluids at Re= 70000 with different values of φ.

VII. CONCLUSION

Based on the literature, it can be concluded that the utilization of nanoparticles in base fluids for improving thermal properties is still an emerging field. The knowledge gap in literature is still considerable in terms of testing different types of nanoparticles with different volume fractions for conjugate heat transfer problems. Furthermore, there are still some open questions about the thermal-physical properties of nanofluids which thus requires further research. The current work tries to address this gap by studying the behavior of various nanofluids.

This paper presents results for the behavior of various nanoparticles mixed with water. Four different nanoparticles namely Al_2O_3, TiO_2, CuO and Cu were numerically tested in a uniformly heated receiver tube with different volume fractions at various Re numbers (30,000, 50000 and 70,000). Based on the results it can be concluded that water-TiO2 is the best candidate for the nanofluids mixture as it has the highest Nu number profile and the lowest pressure drop compared to the other tested nanoparticles. At a volume fraction of 6% and Re = 70000, the Nu number enhancements of the nanofluids water-TiO_2, water-Al_2O_3, water-CuO and water-Cu were found to be 21.5, 20.2, 18.11 and 15.7% with the (PEC) of 1.214, 1.2, 1.18 and 1.155, respectively.

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