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Theoretical assessment of an ejector enhanced oil flooded compression cycle

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Nomenclature		**Subscript**	
Variable		c	condenser
COP	heating coefficient of performance	diff	diffusion nozzle
h	enthalpy (J/kg)	e	evaporator
$\dot{m}$	mass flow rate (kg/s)	g	gas
P	pressure (kPa)	is	isentropic
$\dot{Q}$	heat capacity (W)	l	liquid
s	entropy (J·kg^{-1}·K^{-1})	m	mixture
T	eemperature (K)	mix	mixing chamber
$\dot{W}$	work (W)	mn	motive nozzle
ρ	density (kg/m^3)	ref	refrigerant
υ	specific volume (m^3/kg)	sn	suction nozzle
η	efficiency (-)	o	oil
x	oil mass fraction (-)	oc	oil cooler
		1,2,…,15	state points shown in Figs. 1-2

Highlights

- A combined oil flooded compression (OFC) and ejector cycle is proposed.
- The performance with R32 is compared to ejector and OFC cycles.
- The COP rise can be up to nearly 4% over ejector and OFC cycles.
- The effects of internal heat exchanger on the novel cycle is investigated.

Abstract

Compressor loss and throttling loss are major thermodynamic losses in basic vapor compression cycle. For this reason, an ejector enhanced oil flooded compression cycle is proposed. To evaluate the performance, a mathematical model is established and the performance of this cycle with R32 as the working fluid is