About this document

This document contains screenshots of software available from Cheresources.com. You can find this title in our online store at:

http://www.cheresources.com/cheplusstore/catalogue.php

Clicking the above link should activate your default browser and launch the site.

We recommend using our search feature to find the title.

If you haven't visited our site before, you can find the main page at:

http://www.cheresources.com

Thanks for visiting our site,

Chris Haslego
President
Cheresources, Inc.

1422 Goswick Ridge Road
Midlothian VA 23114

Fax: 561-658-6489
Email: support@cheresources.com

Content Based
Chemical Engineering

ENGINEERING DESIGN CALCULATION - DENNIS KIRK ENGINEERING

Calculation of Gas Properties using EOS - (refer Dr Maria A Barrufet, Texas A&M University - March 1988) Version 1.200

Generalised Cubic Equations Of State:

$$P = \frac{RT}{V - b} - \frac{a}{(V - b1)(V - b2)}$$

$$a = a_c \cdot \alpha(T_r, \omega)^2$$

Equations Of State:

		b	b1	b2	a_c	**a** (Tr.**w**)
Van der Waals	VdW	0.125.R.Tc/Pc	0	0	0.42188.R^2.Tc^2/Pc	1
Redlich-Kwong	RK	0.08664.R.Tc/Pc	-b	0	0.42748.R^2.Tc^2/Pc	$Tr^{-1/4}$
Soave-Redlich-Kwong	SRK	0.08664.R.Tc/Pc	-b	0	0.42748.R^2.Tc^2/Pc	f_{SRK}(Tr,**w**)
Peng-Robinson	PR	0.07780.R.Tc/Pc	-b.(1+sqrt(2))	-b.(1-sqrt(2))	0.45724.R^2.Tc^2/Pc	f_{PR}(Tr,**w**)

$f_{SRK}(Tr,\omega)=1+(0.480+1.574.\omega-0.176.\omega^2).(1-\sqrt{Tr})$

$f_{PR}(Tr,\omega)=1+(0.37464+1.54226.\omega-0.26992.\omega^2).(1-\sqrt{Tr})$

					VdW	RK	SRK	PR	
Pressure	P	100	kPa(g)						**OK**
Temperature	T	20	°C	Density	d (kg/m^3)	1.54389391	1.54355086	1.54313259	1.54491799	
Molecular Weight	MW	18.594	kg/kmol	Molar Vol	V (m^3/kmol)	12.0435736	12.0462503	12.0495155	12.0355903	= MW/d
Critical Temperature	Tc	204.88	°K	Compressibility	Z	0.99478	0.99500108	0.99527078	0.99412059	= P.V/(R.T)
Critical Pressure	Pc	4589	kPa(abs)						0.02888	
Acentric Factor	w	0.0248								

					VdW	RK	SRK	PR
Pressure	P		psi(g)					
Temperature	T		°F	Density	d (lb/ft^3)	0.09636986	0.09634844	0.09632234	0.09643378
Molecular Weight	MW		lb/lb-mol	Molar Vol	V (ft^3/lb-mol)	192.944146	192.987028	193.039338	192.816249
Critical Temperature	Tc		°R	Compressibility	Z	0.99478	0.99500108	0.99527078	0.99412059
Critical Pressure	Pc		psi(a)						
Acentric Factor	w								

-