w water viscosity Mao-Duan correlation @model

(1) $\mu_w(T,p) = 0.001 \cdot \mu_{w0}(T,p) \cdot \mu_r(T,m)$	(2) $\ln \mu_{w0}(T,p) = \sum_{n=1}^{5} d_n \cdot T^{n-3} + \rho_w(T,p) \cdot \sum_{n=6}^{10} d_n \, T^{n-8}$	(3) $\ln \mu_r(T,m) = A \cdot m +$
(4) $A = a_0 + a_1 \, T + a_2 \, T^2$	(5) $B = b_0 + b_1 \, T + b_2 \, T^2$	(6) $C = c_0 + c_1 \, T$
(7) $m = \frac{1,000 \cdot S}{M_{\rm NaCl} \cdot (1 - S)}$		

where

$\mu_w(T,p)$	cp	Dynamic viscosity at temperature T and pressure p
$\mu_r(T,m)$	frac	Correction factor for salinity m (in g-mol/kg), frac
$\rho_w(T,p)$		Pure (Salinity = 0) water density at temperature T and pressure p
T	°K	Temperature
p	Pa	Pressure
S	frac = kg/kg	Water salinity
m	g-mol/kg	Salinity in salt concentration units
$M_{\rm NaCl}$	kg/mol	Molecular weight of NaCl = $58.4428 \cdot 10^{-3}$ kg/mol

and

d_1	$0.28853179 \cdot 10^{7}$	a_0	-0.21319213
d_2	$-0.11072577 \cdot 10^{5}$	a_1	$0.13651589 \cdot 10^{-2}$
d_3	$-0.90834095 \cdot 10^{1}$	a_2	$-0.12191756 \cdot 10^{-5}$
d_4	$0.30925651 \cdot 10^{-1}$		
d_5	$-0.27407100 \cdot 10^{-4}$	b_0	$0.69161945 \cdot 10^{-1}$
d_6	$-0.19283851 \cdot 10^{7}$	b_1	$-0.27292263 \cdot 10^{-3}$
d_7	$0.56216046 \cdot 10^{4}$	b_2	$0.20852448 \cdot 10^{-6}$
d_8	$0.13827250 \cdot 10^{2}$		
d_9	$0.47609523 \cdot 10^{-1}$	c_0	$-0.25988855 \cdot 10^{-2}$
d_{10}	$0.35545041 \cdot 10^{-4}$	c_1	$0.77989227 \cdot 10^{-5}$

See Also