

## Exercise 7

1. An oilfield exhibits the following relative permeability data:

$$S_{wi} = 0.10, \quad \mu_o = 1.0 \text{ mPa.s}, \quad \mu_w = 0.5 \text{ mPa.s}, \quad V_k = 0.6$$

(1) Plot  $f_w$ — $S_w$  fractional flow curve .

(2) Calculate  $S_{wf}=?$   $\overline{S}_{wf}=?$

(3) Calculate Oil recovery factor  $E_R=?$

$S_w$	$K_{ro}$	$K_{rw}$
0.1	1.000	0.000
0.3	0.373	0.070
0.4	0.210	0.169
0.45	0.148	0.226
0.50	0.100	0.300
0.55	0.061	0.376
0.60	0.033	0.476
0.65	0.012	0.600
0.70	0.000	0.740

$S_{wi}$ —Irreducible water saturation

$S_{wf}$  —Water saturation of water-oil front

$\overline{S}_{wf}$  —The averaged water saturation before breakthrough

$\mu_o$  —Viscosity of oil

$\mu_w$  —Viscosity of water

$V_k$  —Permeability variation coefficient

$E_R$  —Oil recovery