

# A Universal Isotherm Model to Capture Adsorption Uptake and Energy Distribution of Porous Heterogeneous Surface

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## Supplementary Information:

The parameters related to universal adsorption model for presented isotherm predictions are given in the tables below:

Table 1: Key values of parameters of universal adsorption model for Type-I isotherm

Parameter	Value	Parameter	Value
$\epsilon_{o1}$ (J/mol)	5799.9	$\epsilon_{o2}$ (J/mol)	1729.6
m1 (J/mol)	1529.9	m2 (J/mol)	635.2
$\alpha_1$	0.307	$\alpha_2$	0.693
$P_s$ (kPa)	3.169	$q^*$ (kg/kg)	0.45

Table 2: Key values of parameters of universal adsorption model for Type-II isotherm

Parameter	Value	Parameter	Value
$\epsilon_{o1}$ (J/mol)	866.8	$\epsilon_{o2}$ (J/mol)	9078.4
m1 (J/mol)	490.4	m2 (J/mol)	3212.5
$\alpha_1$	0.4265	$\alpha_2$	0.5735
$P_s$ (kPa)	2.645	$q^*$ (kg/kg)	0.42

Table 3: Key values of parameters of universal adsorption model for Type-III isotherm

Parameter	Value	Parameter	Value
$\epsilon_{o1}$ (J/mol)	477.75	$\epsilon_{o2}$ (J/mol)	1453.13
m1 (J/mol)	97.64	m2 (J/mol)	591.17
$\alpha_1$	0.5789	$\alpha_2$	0.4211
$P_s$ (kPa)	4.247	$q^*$ (kg/kg)	0.8

Table 4: Key values of parameters of universal adsorption model for Type-IV isotherm

Parameter	Value	Parameter	Value
$\epsilon_{o1}$ (J/mol)	2096.47	$\epsilon_{o2}$ (J/mol)	5613.18
m1 (J/mol)	478.42	m2 (J/mol)	4025.90
$\alpha_1$	0.6755	$\alpha_2$	0.3245
$P_s$ (kPa)	5.629	$q^*$ (kg/kg)	0.36

Table 5: Key values of parameters of universal adsorption model for Type-V isotherm

Parameter	Value	Parameter	Value
$\epsilon_{o1}$ (J/mol)	2309.31	$\epsilon_{o2}$ (J/mol)	4112.51
m1 (J/mol)	1352.90	m2 (J/mol)	121.31
$\alpha_1$	0.3531	$\alpha_2$	0.6469
$P_s$ (kPa)	3.1699	$q^*$ (kg/kg)	0.23

Table 6: Key values of parameters of universal adsorption model for Type-VI isotherm

Parameter	Value	Parameter	Value
$\epsilon_{o1}$ (J/mol)	3133.83	$\epsilon_{o3}$ (J/mol)	235.07
m1 (J/mol)	342.77	m3 (J/mol)	32.32
$\alpha_1$	0.2349	$\alpha_3$	0.1978
$\epsilon_{o2}$ (J/mol)	640.15	$\epsilon_{o4}$ (J/mol)	45
m2 (J/mol)	39.58	m4 (J/mol)	29.37
$\alpha_2$	0.2141	$\alpha_4$	0.3532
$P_s$ (kPa)	3.17	$q^*$ (kg/kg)	0.23