Supplementary Materials

Table S1. R^2 of fDNN with 1-3 hidden layer and 9–16 neurons from 10-fold cross-validation.

Layer number	Hidden neurons							
	9	10	11	12	13	14	15	16
1	0.48	0.46	0.46	0.69	0.69	0.69	0.69	0.44
2	0.61	0.6	0.59	0.58	0.58	0.8	0.59	0.58
3	0.59	0.56	0.53	0.7	0.65	0.56	0.6	0.61

Table S2. The hyperparameter of fDNN: random forest and neural network.

Random Forest	
bootstrap	TRUE
criterion	MSE
max_depth	None
max_features	auto
max_leaf_nodes	None
max_samples	None
min_impurity_decrease	0
min_impurity_split	None
min_samples_leaf	1
min_samples_split	2
n_estimators	65
oob_score	FALSE
random_state	42
verbose	0
Neural Network	
activation	relu
alpha	0.001
batch_size	auto
early_stopping	FALSE
epsilon	1.00E-08
hidden_layer_sizes	(2, 14)
learning_rate	constant
learning_rate_init	0.0001
max_fun	15000
max_iter	50000
momentum	0.9

random_state	42
shuffle	TRUE
solver	adam
tol	0.0001
validation_fraction	0.1
verbose	20

The detailed definitions of each hyperparameter can be found in: https://scikit-learn.org/stable/index.html
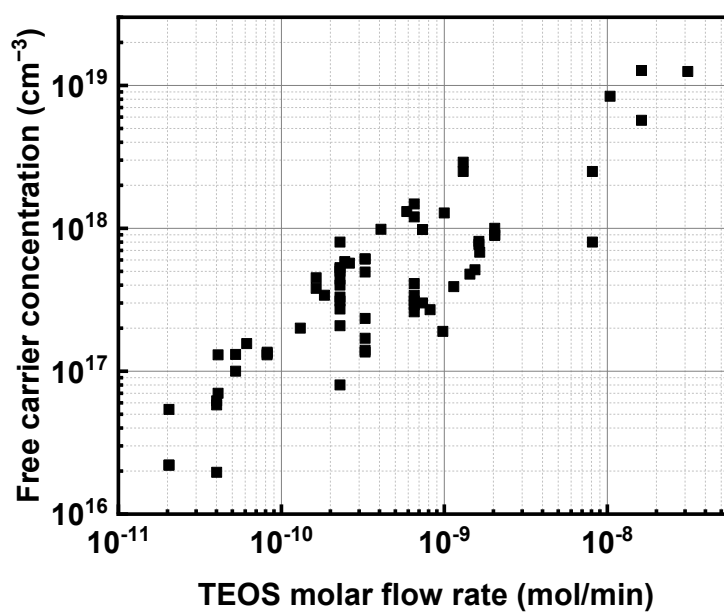

Figure S1. The correlation between the TEOS flow rate (mol/min) and the free carrier concentration measured by Hall effect measurement.