

Data Availability Statement-Influence of catalyst coating on pore characteristics, catalytic activity and pressure drop of catalyzed diesel particulate filter: in-wall vs on-wall

Manuscript ID: CY-ART-06-2025-000762

Fig.3. Pore characteristics of in-wall and on-wall coating CDPF.

Aperture (μm)	Logarithmic differential volume	Aperture (μm)	Increment of mercury intake (ml)	Aperture (μm)	Increment of mercury intake (ml)
208.2	0.01409	207.2	0.01856	207.9	0.01848
108	0.01951	107	0.01414	107.8	0.01666
74.36	0.01794	73.36	0.00614	79.08	0.01302
58.81	0.02178	57.81	0.02799	68.04	0.01186
47.64	0.0355	46.64	0.04043	56.54	0.0226
38.84	0.0243	37.84	0.0321	48.62	0.04094
34.71	0.0216	33.71	0.03717	42.21	0.02451
30.76	0.01495	29.76	0.00622	36.72	0.02312
27.03	0.03277	26.03	0.02329	32.21	0.0301
24.11	0.03679	23.11	0.04854	28.51	0.03192
21.4	0.0455	20.4	0.04737	25.27	0.02797
19.35	0.06226	18.35	0.06298	22.67	0.02369
17.59	0.119	16.59	0.141	20.39	0.03908
16.11	0.2174	15.11	0.2578	18.4	0.04697
14.74	0.576	13.74	0.5596	16.7	0.06304
13.5	1.131	12.5	1.114	15.3	0.1094
12.45	0.911	11.45	0.9615	13.95	0.1939
11.523	0.5564	10.523	0.5865	12.71	0.453
10.709	0.3213	9.709	0.3465	11.64	0.9862
9.957	0.2108	8.957	0.2196	10.75	1.035
9.264	0.1428	8.264	0.1544	10.049	0.6064
8.686	0.1096	7.686	0.1272	9.299	0.4064
8.227	0.09091	7.227	0.1022	8.645	0.2639
7.827	0.04903	6.827	0.05758	8.118	0.1754
7.439	0.04949	6.439	0.05124	7.659	0.1361
7.119	0.04872	6.119	0.07946	7.249	0.1368
6.832	0.03219	5.832	0.02234	6.887	0.08442
6.504	0.03043	5.504	0.06172	6.587	0.08233
4	0.02	4	0.05	6.254	0.07698
3	0.01	3	0.036	5.925	0.06355
2	0.005	2	0.024	4.8	0.052
		1	0.015	4.2	0.048
				3.5	0.03
				2.5	0.025

Fig.4. Pore volume of in-wall and on-wall coating CDPF.

	In-wall	On-wall
3g/L	0.2259	0.2243
6g/L	0.211	0.2156
12g/L	0.1979	0.2138

Fig.5. Specific surface area of in-wall and on-wall coating CDPF.

	In-wall	On-wall
3g/L	3.92	3.81
6g/L	4.3	3.86
12g/L	4.6	4.2

Fig.6. Porosity of in-wall and on-wall coating CDPF.

	In-wall	On-wall
3g/L	39.03	39.65
6g/L	37.69	37.85
12g/L	35.23	37.14

Fig.7. Average pore size of in-wall and on-wall coating CDPF.

	In-wall	On-wall
3g/L	10.6	10.93
6g/L	10.47	10.18
12g/L	9.24	9.71

Fig.8. Pore size distribution of in-wall and on-wall coating CDPF.

(a) In-wall

Pore size	Logarithmic differential volume	Pore size	Increment of mercury intake	Pore size	Increment of mercury intake
μm		μm	ml	μm	ml
211.6	0.00221	211.5	0.01923	212	0.01923
111	0.01209	107.4	0.01755	111	0.01755
75.43	0.00318	75.52	0.00839	75.4	0.00839
58.49	0.02323	63.46	0.02314	58.5	0.02314
47.15	0.02016	51.97	0.02089	47.2	0.02089
37.62	0.02393	44.15	0.02143	37.6	0.02143
32.82	0.02826	37.91	0.02211	32.8	0.02211
28.13	0.02103	33.05	0.02362	28.1	0.02362
24.65	0.02937	28.98	0.02704	24.7	0.02704
21.8	0.03819	25.61	0.02658	21.8	0.02658
19.06	0.04829	22.67	0.02847	19.1	0.02847
17.06	0.0611	20.2	0.04241	17.1	0.04241

15.34	0.1246	18.15	0.03834	15.3	0.03834
13.91	0.2746	16.28	0.04226	13.9	0.04226
12.58	0.5518	14.62	0.07068	12.6	0.07068
11.43	0.8291	13.26	0.1275	11.4	0.1275
10.4	0.8693	11.96	0.2572	10.4	0.2572
9.502	0.6416	10.8	0.5052	9.5	0.5052
8.686	0.4171	9.793	0.8971	8.69	0.8971
7.89	0.2776	9.026	0.8285	7.89	0.8285
7.215	0.1687	8.295	0.5416	7.22	0.5416
6.67	0.1334	7.615	0.3653	6.67	0.3653
6.232	0.1384	6.998	0.248	6.23	0.248
5.819	0.134	6.508	0.1931	5.82	0.1931
5.415	0.07015	6.102	0.1621	5.42	0.1621
5.096	0.07306	5.693	0.1472	5.1	0.1472
4.799	0.01342	5.342	0.114	4.8	0.114
4.476	0.00892	5.043	0.0814	4.48	0.0814
		4.705	0.06871		
		4.4	0.05165		

(b) On-wall

Pore size	Logarithmic differential volume	Pore size	Increment of mercury intake	Pore size	Increment of mercury intake
μm		μm	ml	μm	ml
208.2	0.01409	207.2	0.01856	207.9	0.01848
108	0.01951	107	0.01414	107.8	0.01666
74.36	0.01794	73.36	0.00614	79.08	0.01302
58.81	0.02178	57.81	0.02799	68.04	0.01186
47.64	0.0355	46.64	0.04043	56.54	0.0226
38.84	0.0243	37.84	0.0321	48.62	0.04094
34.71	0.0216	33.71	0.03717	42.21	0.02451
30.76	0.01495	29.76	0.00622	36.72	0.02312
27.03	0.03277	26.03	0.02329	32.21	0.0301
24.11	0.03679	23.11	0.04854	28.51	0.03192
21.4	0.0455	20.4	0.04737	25.27	0.02797
19.35	0.06226	18.35	0.06298	22.67	0.02369
17.59	0.119	16.59	0.141	20.39	0.03908
16.11	0.2174	15.11	0.2578	18.4	0.04697
14.74	0.576	13.74	0.5596	16.7	0.06304
13.5	1.131	12.5	1.114	15.3	0.1094
12.45	0.911	11.45	0.9615	13.95	0.1939
11.523	0.5564	10.523	0.5865	12.71	0.453
10.709	0.3213	9.709	0.3465	11.64	0.9862
9.957	0.2108	8.957	0.2196	10.75	1.035
9.264	0.1428	8.264	0.1544	10.049	0.6064

8.686	0.1096	7.686	0.1272	9.299	0.4064
8.227	0.09091	7.227	0.1022	8.645	0.2639
7.827	0.04903	6.827	0.05758	8.118	0.1754
7.439	0.04949	6.439	0.05124	7.659	0.1361
7.119	0.04872	6.119	0.07946	7.249	0.1368
6.832	0.03219	5.832	0.02234	6.887	0.08442
6.504	0.03043	5.504	0.06172	6.587	0.08233
4	0.02	4	0.05	6.254	0.07698
3	0.01	3	0.036	5.925	0.06355
2	0.005	2	0.024	4.8	0.052
		1	0.015	4.2	0.048
				3.5	0.03
				2.5	0.025
				1.2	0.017

Fig.10. Fitting curve of kinetic parameters for CDPF samples with different catalyst loading states.

(a) In-wall

1/T(*10 ³)	ln(β da/dT) in-3	ln(β da/dT) in-6	ln(β da/dT) in-12	ln(β da/dT) on-3	ln(β da/dT) on-6	ln(β da/dT) on-12
1.22	-1.4026	-1.4026	-1.1026			-1.4026
1.212	-1.265	-1.301	-1.06			-1.2
1.204	-1.1894	-1.1894	-0.9174			-0.9974
1.196	-1.0738	-1.0978	-0.8348			-0.7948
1.188	-0.9922	-0.9862	-0.7322			-0.5922
1.18	-0.8646	-0.8946	-0.6396			-0.3896
1.172	-0.757	-0.793	-0.547			-0.187
1.164	-0.6194	-0.6714	-0.4544			0.0156
1.156	-0.5418	-0.5498	-0.3618			0.2182
1.148	-0.4342	-0.4882	-0.2892			0.4208
1.14	-0.3566	-0.3866	-0.1766			0.6234
1.132	-0.219	-0.285	-0.084			0.826
1.124	-0.1114	-0.1834	0.0086			1.0286
1.116	-0.0038	-0.0718	0.1312			1.2312
1.108	0.1038	0.0198	0.1938			1.4338
1.1	0.2414	0.1214	0.2864			1.6364
1.092	0.329	0.183	0.389			1.839
1.084	0.4266	0.3146	0.4216			2.0416
1.076	0.5342	0.4262	0.5442			2.2442
1.068	0.6618	0.5378	0.6568			2.4468

(b) On-wall

1/T(*10 ³)	ln(β da/dT) in-3	ln(β da/dT) in-6	ln(β da/dT) in-12	ln(β da/dT) on-3	ln(β da/dT) on-6	ln(β da/dT) on-12
1.22				-1.3126	-1.3826	-1.4826
1.212				-1.23	-1.21	-1.06

1.204		-1.0374	-1.1074	-0.9374
1.196		-0.9948	-1.0048	-0.8348
1.188		-0.8322	-0.9122	-0.7322
1.18		-0.7496	-0.7996	-0.6596
1.172		-0.637	-0.697	-0.537
1.164		-0.5144	-0.5844	-0.4644
1.156		-0.4418	-0.4918	-0.3618
1.148		-0.3192	-0.4092	-0.2892
1.14		-0.1966	-0.2876	-0.1766
1.132		-0.074	-0.183	-0.084
1.124		0.0386	-0.0824	0.009
1.116		0.1512	0.0232	0.1312
1.108		0.2938	0.1338	0.1618
1.1		0.3564	0.2364	0.2764
1.092		0.479	0.339	0.389
1.084		0.6116	0.4616	0.4216
1.076		0.7342	0.5742	0.5442
1.068		0.8368	0.6468	0.6568

Fig.12. Exhaust back pressure of CDPF with different coating methods.

Load (%)	In-wall back pressure	On-wall back pressure
100	11.32875	10.24
75	9.4025	8.47375
50	7.28625	6.725
10	4.84343	4.50125

Load (%)	In-wall back pressure	On-wall back pressure
100	5.69	5.31
75	3.42375	3.15251
50	2.4875	2.32875
0	1.19231	1.01751