

Ensemble learning to predict solar-to-hydrogen energy conversion based on photocatalytic water splitting over doped-TiO₂

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The dataset of photocatalytic water splitting by doped TiO₂:

(Dop: Dopant, In_1: Dopant/Ti mole ratio, In_2: Calcination Temperature (°C), In_3: Calcination Time (h), In_4: Cocatalyst, In_5: Weight Percent of Cocatalyst (wt%), In_6: Catalyst concentration (g/L), In_7: Sacrificial Agents, In_8: Percent of Sacrificial reagents (vol%), In_9: Wavelength (nm), Out: Hydrogen production rate (μmol/g/h))

No.	Dop	In_1	In_2	In_3	In_4	In_5	In_6	In_7	In_8	In_9	Out
1	C	0.002	500	4	none	0	0.25	MeOH	10	600	1.20
2	C	0.002	500	4	none	0	0.25	MeOH	10	600	1.50
3	N	0.004	500	5	none	0	1.29	MeOH	25.8	600	5.00
4	Nb	0.03	500	2	Pd	0.55	0.5	MeOH	30	550	6.00
5	La	0.0303	800	0	Pt	1.5	3.85	EA	3.85	365	8.00
6	Co	0.0027	400	5	none	0	2	none	0	500	8.50
7	La	0.024	700	0	Pt	1.5	3.85	EA	3.85	365	10.50
8	La	0.0303	700	0	Pt	1.5	3.85	EA	3.85	365	10.50
9	La	0.0178	800	0	Pt	1.5	3.85	EA	3.85	365	11.00
10	La	0.024	800	0	Pt	1.5	3.85	EA	3.85	365	11.00
11	N	0.006	500	5	none	0	1.29	MeOH	25.8	600	11.50
12	N	0.06	500	4	none	0	2	MeOH	20	585	12.20
13	La	0.0058	700	0	Pt	1.5	3.85	EA	3.85	365	12.50
14	La	0.0088	700	0	Pt	1.5	3.85	EA	3.85	365	12.50
15	In	0.0085	500	4	none	0	2	MeOH	20	585	13.00
16	N	0	400	1	Au	1	1	MeOH	30	254	13.80
17	La	0.0058	800	0	Pt	1.5	3.85	EA	3.85	365	16.00
18	La	0.0178	700	0	Pt	1.5	3.85	EA	3.85	365	16.00
19	Ce	0.006	400	0	none	0	1.35	MeOH	5.4	585	17.00
20	N	0	800	3	Au	0	10	MeOH	10	500	19.00
21	pure	2	500	3	Rh	1	1	MeOH	8	600	20.00
22	Ag	0	450	3	none	0	0.3	MeOH	10	500	26.00
23	Nb	0.03	500	2	Pd	1	0.5	MeOH	30	340	27.00
24	pure	0	200	2	Au	2	0.75	EA	5	585	27.06
25	P	0.335	700	4	Pt	3	0.2	none	0	626	28.00
26	La	0.0088	800	0	Pt	1.5	3.85	EA	3.85	365	32.00
27	N	0	700	3	Au	0	10	MeOH	10	500	33.00
28	N	0	400	0	none	0	1.35	MeOH	5.4	585	36.00

29	N	0	500	3	Au	0	10	MeOH	10	500	38.00
30	N	0	500	2	Pt	0.2	2	MeOH	25	500	39.00
31	P	0.124	700	4	Pt	3	0.2	none	0	500	43.33
32	N	0.012	500	5	none	0	1.29	MeOH	25.8	600	44.50
33	Ag	0.01	0	0	none	0	0.05	none	0	254	51.00
34	N	0	400	3	Au	0	10	MeOH	10	500	52.00
35	N	0.06	500	4	Pd	2	2	MeOH	20	585	56.60
36	P	0.335	700	4	Pt	3	0.2	none	0	585	63.33
37	In	0.0085	500	4	Pd	2	2	MeOH	20	585	63.40
38	Nb	0.03	500	2	Pt	1	0.5	MeOH	30	550	70.00
39	La	0.0117	800	0	Pt	1.5	3.85	EA	3.85	365	72.50
40	N	0.01	500	5	none	0	1.29	MeOH	25.8	600	74.50
41	N	0	300	3	Au	0	10	MeOH	10	500	78.00
42	Ag	0.01	0	0	none	0	0.015	none	0	254	78.00
43	pure	0	200	2	Au	2	0.75	Na ₂ SO ₃	0	500	78.43
44	P	0.232	700	4	Pt	3	0.2	none	0	500	83.33
45	N	0	800	0	Pt	0	10	MeOH	10	500	87.30
46	pure	0	200	5	Au	0.2	1.67	MeOH	20	500	88.00
47	P	0.52	700	4	Pt	3	0.2	none	0	500	96.67
48	P	0.431	400	4	Pt	3	0.2	none	0	626	96.67
49	La	0.0148	800	0	Pt	1.5	3.85	EA	3.85	365	98.50
50	pure	0	600	0.5	Ru	1	0.5	MeOH	30	550	100.00
51	Co	0.0678	400	5	none	0	2	none	0	500	100.00
52	P	0.232	400	4	Pt	3	0.2	none	0	500	106.67
53	Cu	0.00625	450	3	none	0	0.3	MeOH	10	500	110.00
54	Co	0.0068	400	5	none	0	2	none	0	500	120.00
55	P	0.431	700	4	Pt	3	0.2	none	0	500	123.33
56	N	0	400	2	Pt	0.2	2	MeOH	25	500	125.00
57	P	0.335	700	4	Pt	3	0.2	none	0	522	126.67
58	Nb	0.002	400	1	none	0	1	EA	25	500	145.00
59	Ni	0.045	500	0.5	none	0	0.67	none	0	590	146.30
60	pure	0	300	0	Pt	0	10	MeOH	10	500	154.60
61	P	0.431	400	4	Pt	3	0.2	none	0	585	156.67
62	Nb	0.004	400	1	none	0	1	EA	25	500	163.00

63	Co	0.0407	400	5	none	0	2	none	0	500	170.00
64	pure	0	200	5	Pd	0.2	1.67	MeOH	20	500	170.10
65	pure	0	500	0.5	Ag	6	0.67	EA	10	254	173.51
66	Ag	0.04	0	0	none	0	1	MeOH	2	585	175.00
67	Co	0.0136	400	5	none	0	2	none	0	500	175.00
68	P	0.335	700	4	Pt	3	0.2	none	0	500	176.67
69	Fe	0.04	500	0.5	none	0	0.67	none	0	590	178.00
70	P	0.431	400	4	Pt	3	0.2	none	0	522	180.00
71	Fe	0.04	500	0.5	none	0	0.67	none	0	254	182.30
72	P	0.335	700	4	Pt	3	0.2	none	0	456	183.33
73	P	0.335	400	4	Pt	3	0.2	none	0	500	186.67
74	Ag	0.01	0	0	none	0	0.025	none	0	254	188.00
75	Bi	0.05	130	48	none	0	8	Gly	5	500	190.00
76	P	0.6	400	4	Pt	3	0.2	none	0	500	196.67
77	pure	0	600	0.5	Ru	5	0.5	MeOH	30	550	200.00
78	Cu	0.005	650	12	none	0	0.025	EA	50	325	200.00
79	Fe	0.04	500	0.5	none	0	0.67	EA	10	590	205.24
80	N	0	300	0	Pt	0	10	MeOH	10	500	205.80
81	Nd	0.0083	450	4	none	0	1	MeOH	48.5	254	208.50
82	pure	0	200	5	Pt	0.2	1.67	MeOH	20	500	210.00
83	Bi	0.004	130	48	none	0	8	Gly	5	500	210.00
84	Ni	0.045	500	0.5	none	0	0.67	EA	10	590	213.75
85	Co	0.0271	400	5	none	0	2	none	0	500	220.00
86	Fe	0.04	500	0.5	none	0	0.67	EA	10	254	220.59
87	Ni	0.045	500	0.5	none	0	0.67	none	0	254	221.00
88	Nd	0.0028	450	4	none	0	1	MeOH	48.5	254	237.50
89	N	36.47	450	1	Pt	1	1	MeOH	20	585	240.00
90	N	36.47	450	3	Pt	1	1	MeOH	20	585	240.00
91	Fe	0.04	500	0.5	none	0	0.67	EA	10	590	248.20
92	Fe	0.04	500	0.5	none	0	0.67	EA	10	590	248.20
93	N	10	350	0	Pt	0	5	Na ₂ SO ₃	0	590	250.00
94	Ag	0.0015	450	3	none	0	0.3	MeOH	10	500	250.00
95	Fe	0.04	500	0.5	none	0	0.67	EA	10	590	253.75
96	Nd	0.0044	450	4	none	0	1	MeOH	48.5	254	257.50

97	Nd	0.0056	450	4	none	0	1	MeOH	48.5	254	262.50
98	Bi	0.05	600	12	none	0	0.025	EA	50	331	265.00
99	pure	0	500	0.5	Ag	6	0.67	EA	10	590	269.65
100	Sn	0.102	180	12	none	0	0.25	TEA	10	500	271.20
101	Bi	0.007	130	48	none	0	8	Gly	5	500	275.00
102	Bi	0.1	600	12	none	0	0.025	EA	50	256	280.00
103	P	0.335	700	4	Pt	3	0.2	none	0	400	280.00
104	Cu	0.005	650	12	none	0	0.025	EA	50	300	280.00
105	Nb	0.006	400	1	none	0	1	EA	25	290	280.00
106	Sr	0	450	6	Pt	1	0.417	MeOH	25	590	289.00
107	Bi	0.05	600	12	none	0	0.025	EA	50	256	290.00
108	P	0.52	400	4	Pt	3	0.2	none	0	500	293.33
109	N	0.255	600	12	none	0	0.1	EA	50	338	300.00
110	N	0.255	600	12	none	0	0.1	EA	50	256	300.00
111	Ag	0.0148	450	3	none	0	0.3	MeOH	10	500	300.00
112	Co	0	400	5	none	0	2	Gly	5	500	300.00
113	Nb	0.05	500	2	Pt	1.5	0.5	MeOH	30	340	300.00
114	Pt	0.0062	550	3	none	0	2	MeOH	10	600	300.00
115	Nd	0.0011	450	4	none	0	1	MeOH	48.5	254	307.50
116	Sn	0.051	180	12	none	0	0.25	TEA	10	500	318.20
117	Nb	0.008	400	1	none	0	1	EA	25	500	333.00
118	Fe	0.04	500	0.5	Ag	6	0.67	EA	10	590	336.27
119	Fe	0.05	500	0.5	Ag	5.4	0.67	EA	10	254	349.83
120	Bi	0.01	130	48	none	0	8	Gly	5	500	350.00
121	pure	0	200	2	none	0	0.75	EA	5	500	352.94
122	P	0.431	400	4	Pt	3	0.2	none	0	456	353.33
123	N	0.06	450	2	none	0	0.67	MeOH	10	500	370.00
124	Nb	0.006	400	1	none	0	1	EA	25	600	377.00
125	N	0.04	450	2	none	0	0.67	MeOH	10	500	380.00
126	N	36.47	400	1	Pt	1	1	MeOH	20	585	380.00
127	P	0.431	400	4	Pt	3	0.2	none	0	500	380.00
128	Nb	0.006	400	1	none	0	1	EA	25	500	382.00
129	Bi	0.0025	600	12	none	0	0.025	EA	50	331	385.00
130	pure	0	600	5	Au	0.2	1.67	MeOH	20	500	398.50

131	Fe	0.045	500	0.5	Ag	6	0.67	EA	10	254	399.96
132	Sn	0.034	180	12	none	0	0.25	TEA	10	500	401.60
133	Ag	0.0074	450	3	none	0	0.3	MeOH	10	500	415.00
134	N	0	300	2	Pt	0.2	2	MeOH	25	500	416.00
135	N	0	400	1	Au	1	1	MeOH	30	565	431.20
136	N	0	250	2	Pt	0.2	2	MeOH	25	500	450.00
137	pure	0	500	2	Au	1	1	MeOH	25	470	468.00
138	Ag	0.01	0	0	none	0	0.02	none	0	254	470.00
139	La	0.0303	600	0	Pt	1.5	3.85	EA	3.85	365	476.00
140	Fe	0.05	500	0.5	Ag	5.4	0.67	EA	10	590	476.06
141	N	0	150	2	Pt	0.2	2	MeOH	25	500	490.00
142	N	0.304	600	15	none	0	0.1	EA	50	338	500.00
143	Nb	0.01	500	2	Pt	1.5	0.5	MeOH	30	340	500.00
144	Bi	0.01	600	12	none	0	0.025	EA	50	331	507.00
145	Bi	0.0025	600	12	none	0	0.025	EA	50	256	510.00
146	Bi	0.005	600	12	none	0	0.025	EA	50	331	510.00
147	Fe	0.04	500	0.5	Ag	6	0.67	EA	10	590	512.35
148	Bi	0.02	130	48	none	0	8	Gly	5	500	514.00
149	Fe	0.045	500	0.5	Ag	6	0.67	EA	10	590	515.45
150	N	0	400	1	Au	1	1	MeOH	30	254	523.40
151	pure	0	550	4	Ag	3	0.625	EA	0	364	542.00
152	W	0.1	350	3	none	0	0.5	EA	10	500	560.00
153	Bi	0.01	600	12	none	0	0.025	EA	50	256	570.00
154	N	0	200	2	Pt	0.2	2	MeOH	25	500	570.00
155	Ag	0.0037	450	3	none	0	0.2	MeOH	10	500	580.00
156	N	2	350	0	Pt	0	5	Na ₂ SO ₃	0	500	590.00
157	pure	0	600	0.5	Ru	2	0.5	MeOH	30	550	600.00
158	N	0	450	4	none	0	1	MeOH	10	500	601.00
159	N	6	350	0	Pt	0	5	Na ₂ SO ₃	0	500	610.00
160	N	6	350	0	Pt	0	5	Na ₂ SO ₃	0	590	610.00
161	P	0.431	400	4	Pt	3	0.2	none	0	400	616.67
162	La	0	800	0	Pt	1.5	3.85	EA	3.85	365	628.00
163	N	6	500	0	Pt	0	5	Na ₂ SO ₃	0	590	630.00
164	pure	0	0	0	Cu	0	0.5	MeOH	30	500	680.00

165	Fe	0.001	500	3	Pt	0.5	0.3	MeOH	8.33	550	680.00
166	Fe	0.01	500	3	Pt	0.5	0.03	MeOH	8.33	550	682.00
167	N	36.47	550	3	Pt	1	1	MeOH	20	585	700.00
168	Nb	0.03	500	2	Pt	1.5	0.5	MeOH	30	340	700.00
169	Nb	0.05	500	2	Pt	0.5	0.5	MeOH	30	340	700.00
170	Nb	0.03	500	2	Pt	1	0.5	MeOH	30	340	700.00
171	pure	0	0	0	Ni	0.5	10	MeOH	50	290	720.00
172	pure	0	500	2	Au	2	1	MeOH	25	470	720.00
173	N	0.02	450	2	none	0	0.67	MeOH	10	500	730.00
174	N	3.65	500	1	Pt	1	1	MeOH	20	585	730.00
175	pure	0	600	0.5	Ru	3	0.5	MeOH	30	550	750.00
176	Zn	0.26	450	2	none	0	0.8	MeOH	20	600	750.00
177	La	0.0148	700	0	Pt	1.5	3.85	EA	3.85	365	750.50
178	N	5.21	500	1	Pt	1	1	MeOH	20	585	760.00
179	pure	0	600	5	Pd	0.2	1.67	MeOH	20	500	761.00
180	N	0.08	450	2	none	0	0.67	MeOH	10	500	770.00
181	Sn	0.017	180	12	none	0	0.25	TEA	10	500	789.50
182	Ag	0.01	0	0	none	0	0.02	MeOH	20	254	795.00
183	Bi	0.005	600	12	none	0	0.025	EA	50	256	800.00
184	Pt	0.0021	550	3	none	0	2	MeOH	10	600	800.00
185	pure	0	600	5	Pt	0.2	1.67	MeOH	20	500	809.10
186	W	0.1	350	3	none	0	0.5	EA	10	500	820.00
187	La	0	600	0	Pt	1.5	3.85	EA	3.85	365	827.00
188	pure	0	500	2	Au	0.5	1	MeOH	25	470	828.00
189	pure	0	0	0	Pd	0.5	10	MeOH	50	290	840.00
190	pure	0	300	5	Au	0.1	2	MeOH	0.1	585	840.00
191	K	0.01	180	0	Pd	0.8	0.5	MeOH	10	490	846.00
192	La	0.024	600	0	Pt	1.5	3.85	EA	3.85	365	876.50
193	Be	0.0125	400	1	Pt	0.5	0.5	EA	1	365	900.00
194	Al	0.002	180	0	Pd	0.8	0.5	MeOH	10	490	904.00
195	Ag	0.031	400	1	none	0	0.5	MeOH	50	585	910.00
196	Mg	0.002	180	0	Pd	0.8	0.5	MeOH	10	490	926.00
197	Sr	0.009	450	6	Pt	1	0.417	MeOH	25	590	933.00
198	La	0.0178	600	0	Pt	1.5	3.85	EA	3.85	365	953.00

199	La	0	700	0	Pt	1.5	3.85	EA	3.85	365	968.50
200	La	0.0117	700	0	Pt	1.5	3.85	EA	3.85	365	968.50
201	Be	0.0125	600	1	Pt	0.5	0.5	EA	1	365	972.00
202	Ag	0.01	0	0	none	0	0.02	IPA	20	254	983.00
203	N	7.29	500	1	Pt	1	1	MeOH	20	585	1000.00
204	S	0.02	450	2	none	0	0.67	MeOH	10	500	1000.00
205	Pt	0.0041	550	3	none	0	2	MeOH	10	600	1000.00
206	La	0.0058	600	0	Pt	1.5	3.85	EA	3.85	365	1000.50
207	pure	0	300	5	Pt	0.3	1	MeOH	20	585	1080.00
208	K	0.005	180	0	Pd	0.8	0.5	MeOH	10	490	1092.00
209	Sr	0.012	450	6	Pt	1	0.417	MeOH	25	590	1092.00
210	Cu	0.0375	450	3	none	0	0.3	MeOH	10	500	1180.00
211	K	0.001	180	0	Pd	0.8	0.5	MeOH	10	490	1186.00
212	pure	0	0	0	Pd	1	10	MeOH	50	290	1200.00
213	pure	0	350	2	Au	1	0.325	TB	10	365	1200.00
214	Be	0.0425	400	1	Pt	0.5	0.5	EA	1	365	1200.00
215	N	0.304	600	15	none	0	0.1	EA	50	256	1200.00
216	S	0.08	450	2	none	0	0.67	MeOH	10	500	1200.00
217	Nb	0.01	450	2	Pt	0.5	0.5	MeOH	30	550	1200.00
218	Nb	0.05	500	2	Pt	1	0.5	MeOH	30	340	1200.00
219	Ag	0.01	0	0	none	0	0.02	EA	20	254	1251.00
220	Na	0.002	180	0	Pd	0.8	0.5	MeOH	10	490	1290.00
221	Mn	0.015	500	5	none	0	0.5	MeOH	50	254	1376.00
222	Cu	0.0125	450	3	none	0	0.3	MeOH	10	500	1400.00
223	Ba	5	550	3	Pt	0	0.33	TEA	10	500	1436.00
224	Bi	0.05	130	48	none	0	8	Gly	5	290	1450.00
225	Be	0.0325	400	1	Pt	0.5	0.5	EA	1	365	1460.00
226	pure	0	0	0	Co	2	1	MeOH	50	290	1490.00
227	S	0.04	450	2	none	0	0.67	MeOH	10	500	1500.00
228	Be	0.0125	500	1	Pt	0.5	0.5	EA	1	365	1530.00
229	Bi	0.004	130	48	none	0	8	Gly	5	290	1530.00
230	K	0.002	180	0	Pd	0.8	0.5	MeOH	10	490	1532.00
231	Mn	0.044	500	5	none	0	0.5	MeOH	50	254	1534.00
232	pure	0	0	0	Ni	1	10	MeOH	50	290	1560.00

233	Fe	0.001	500	3	Pt	0.5	0.15	MeOH	8.33	550	1560.00
234	Fe	0.005	500	3	Pt	0.5	0.03	MeOH	8.33	550	1572.00
235	Nb	0.01	500	2	Pt	0.5	0.5	MeOH	30	340	1600.00
236	Nb	0.075	450	2	Pt	0.5	0.5	MeOH	30	340	1720.00
237	Mn	0.073	500	5	none	0	0.5	MeOH	50	254	1736.00
238	Cu	0.0148	450	3	none	0	0.2	MeOH	10	500	1750.00
239	pure	0	550	4	Ni	3	0.625	EA	0	364	1757.00
240	Be	0.0125	600	0.5	Pt	0.5	0.5	EA	1	365	1764.00
241	Mn	0.145	500	5	none	0	0.5	MeOH	50	254	1778.00
242	Be	0.0225	400	1	Pt	0.5	0.5	EA	1	365	1800.00
243	La	0.0088	600	0	Pt	1.5	3.85	EA	3.85	365	1827.00
244	Fe	0.003	500	3	Pt	0.5	0.03	MeOH	8.33	550	1830.00
245	Fe	0.001	500	3	Pt	0.5	0.09	MeOH	8.33	550	1840.00
246	K	0.01	180	0	Pd	0.8	0.2	MeOH	10	490	1850.00
247	S	0.06	450	2	none	0	0.67	MeOH	10	500	1850.00
248	pure	0	550	3	Pt	0	0.33	TEA	10	500	1881.80
249	Bi	0.007	130	48	none	0	8	Gly	5	290	1900.00
250	Nb	0.03	500	2	Pt	0.5	0.5	MeOH	30	340	1950.00
251	N	18.23	500	1	Pt	1	1	MeOH	20	585	1980.00
252	Be	0.005	400	1	Pt	0.5	0.5	EA	1	365	2000.00
253	Nb	0.01	500	2	Pt	1	0.5	MeOH	30	340	2000.00
254	Nb	0.075	450	2	Pt	0.5	0.5	MeOH	30	550	2150.00
255	Be	0.0125	600	2	Pt	0.5	0.5	EA	1	365	2200.00
256	Co	0.0678	400	5	none	0	2	Gly	5	500	2214.00
257	Be	0.0125	600	1.5	Pt	0.5	0.5	EA	1	365	2340.00
258	Be	1.0125	400	1	Pt	0.5	0.5	EA	2	365	2460.00
259	pure	0	0	0	Co	1	1	MeOH	50	290	2480.00
260	N	0.255	600	12	Pd	1	0.1	EA	50	338	2500.00
261	La	0.0148	600	0	Pt	1.5	3.85	EA	3.85	365	2521.50
262	K	0.01	180	0	Pd	0.8	0.1	MeOH	10	490	2580.00
263	Zn	0.26	450	2	none	0	0.8	MeOH	20	500	2660.00
264	F	0	500	2	Pt	0.6	0.2	MeOH	20	500	2680.00
265	N	10	350	0	Pt	0	5	Na ₂ SO ₃	0	500	2700.00
266	Nb	0.03	500	2	Pd	0.55	0.5	MeOH	30	340	2700.00

267	Nb	0.03	500	2	Pd	1	0.5	MeOH	30	340	2700.00
268	Ag	0.031	400	1	none	0	0.5	MeOH	50	365	2880.00
269	pure	0	0	0	Pt	6	1	IPA	25	290	2900.00
270	Bi	0.01	130	48	none	0	8	Gly	5	290	2941.00
271	N	36.47	500	1	Pt	1	1	MeOH	20	585	2980.00
272	pure	0	600	0.5	Ru	1	0.5	MeOH	30	340	3000.00
273	pure	0	0	0	Cu	40	0.5	MeOH	30	500	3000.00
274	Fe	0.001	500	3	Pt	0.5	0	MeOH	8.33	550	3000.00
275	Co	0.0027	400	5	none	0	2	Gly	5	500	3012.00
276	Nb	0.03	500	2	Pt	1	0.5	MeOH	30	340	3050.00
277	Nb	0.03	500	2	Pt	1	0.5	MeOH	30	340	3050.00
278	N	6	600	0	Pt	0	5	Na ₂ SO ₃	0	590	3140.00
279	Ru	0.002	500	3	Pt	0.5	0.83	MeOH	8.3	590	3160.00
280	pure	0	600	0.5	Ru	5	0.5	MeOH	30	340	3200.00
281	N	0.304	600	15	Pd	1	0.1	EA	50	338	3300.00
282	N	0.304	600	15	Pt	1	0.1	EA	50	338	3300.00
283	pure	0	0	0	Ni	2	1	MeOH	50	290	3310.00
284	pure	0	200	2	Au	2	0.75	MeOH	5	500	3372.55
285	pure	0	0	0	Ni	1	1	MeOH	50	290	3390.00
286	Fe	0.0015	500	3	Pt	0.5	0.03	MeOH	8.33	550	3440.00
287	Fe	0.001	500	3	Pt	0.5	0.05	MeOH	8.33	550	3450.00
288	La	0.0117	600	0	Pt	1.5	3.85	EA	3.85	365	3503.00
289	Fe	0.0005	500	3	Pt	0.5	0.03	MeOH	8.33	550	3684.00
290	Fe	0.001	500	3	Pt	0.5	0.02	MeOH	8.33	550	3700.00
291	pure	0	600	0.5	Ru	2	0.5	MeOH	30	340	3900.00
292	Co	0.0136	400	5	none	0	2	Gly	1	500	3900.00
293	Ag	0.01	0	0	none	0	0.05	Na ₂ S/Na ₂ SO ₃	0	254	4108.00
294	pure	0	0	0	Cu	20	0.5	MeOH	30	500	4200.00
295	Fe	0.001	500	3	Pt	0.5	0.04	MeOH	8.33	550	4200.00
296	Fe	0.0013	500	3	Pt	0.5	0.03	MeOH	8.33	550	4214.00
297	pure	0	350	2	Pd	0.5	0.325	TB	10	365	4300.00
298	pure	0	600	0.5	Ru	3	0.5	MeOH	30	340	4600.00
299	Bi	0.02	130	48	none	0	8	Gly	5	290	4708.00
300	Fe	0.001	500	3	Pt	0.5	0.03	MeOH	8.33	550	4846.00

301	Nb	0.05	450	2	Pt	0.5	0.5	MeOH	30	550	5140.00
302	Co	0.0407	400	5	none	0	2	Gly	5	500	5234.00
303	pure	0	0	0	Cu	2	1	MeOH	50	290	5300.00
304	Mg	3	550	3	Pt	0	0.33	TEA	10	500	5441.00
305	Nb	0.025	450	2	Pt	0.5	0.5	MeOH	30	550	5450.00
306	pure	0	350	2	Pd	1	0.325	TB	10	365	5500.00
307	Ru	0.0005	500	3	Pt	0.5	0.83	MeOH	8.3	590	5500.00
308	Ru	0.0015	500	3	Pt	0.5	0.83	MeOH	8.3	590	5600.00
309	Nb	0.01	450	2	Pt	0.5	0.5	MeOH	30	340	5610.00
310	pure	0	0	0	Cu	10	0.5	MeOH	30	500	5700.00
311	Co	0.0136	400	5	none	0	2	Gly	2	500	6000.00
312	Ca	0.1	550	3	Pt	0	0.33	TEA	10	500	6193.00
313	Nb	0.05	450	2	Pt	0.5	0.5	MeOH	30	340	6250.00
314	pure	0	200	2	Au	2	0.75	EA	5	500	6274.51
315	pure	0	0	0	Pt	6	1	EA	25	290	6300.00
316	pure	0	500	2	Au	0.5	1	MeOH	25	400	6300.00
317	pure	0	350	2	Pt	1	0.325	TB	10	365	6400.00
318	Ru	0.001	500	3	Pt	0.5	0.83	MeOH	8.3	590	6550.00
319	N	0.255	600	12	Pt	1	0.1	EA	50	338	7000.00
320	pure	0	0	0	Cu	5	0.5	MeOH	30	500	7100.00
321	pure	0	300	5	Au	2	2	MeOH	1	585	7200.00
322	pure	1	500	3	Rh	1	1	MeOH	8	500	7270.00
323	pure	0	0	0	Pt	6	1	MeOH	25	290	7600.00
324	pure	0	0	0	Cu	0.5	0.5	MeOH	30	500	7600.00
325	pure	0	0	0	Cu	3	0.5	MeOH	30	500	7600.00
326	Nb	0.025	450	2	Pt	0.5	0.5	MeOH	30	340	7860.00
327	pure	0	0	0	Cu	1	0.5	MeOH	30	500	8000.00
328	Co	0.0271	400	5	none	0	2	Gly	5	500	8045.00
329	N	0	400	1	Au	1	1	MeOH	30	565	8252.00
330	pure	0	0	0	Cu	1	1	MeOH	50	290	8470.00
331	Co	0.0136	400	5	none	0	2	Gly	20	500	8700.00
332	Co	0.0136	400	5	none	0	2	Gly	4	500	8900.00
333	Co	0.0136	400	5	none	0	2	Gly	10	500	9300.00
334	pure	0	0	0	Pt	2	1	IPA	25	290	9400.00

335	pure	0	0	0	Cu	2	0.5	MeOH	30	500	9500.00
336	Co	0.0136	400	5	none	0	2	Gly	8	500	9700.00
337	pure	0	350	2	Au	1	0.325	IPA	10	365	9800.00
338	Co	0.0068	400	5	none	0	2	Gly	5	500	9851.00
339	pure	0	0	0	none	0	0.02	Na ₂ S/Na ₂ SO ₃	0	254	9931.00
340	pure	0	350	2	Pt	1	0.325	IPA	10	365	10000.00
341	W	0.1	350	3	none	0	0.5	EA	10	290	10000.00
342	pure	0	500	2	Cu	1	0.77	MeOH	20	540	10400.00
343	Co	0.0136	400	5	none	0	2	Gly	6	500	10400.00
344	Co	0.0136	400	5	none	0	2	Gly	5	500	11021.00
345	pure	0	0	0	Pt	2	1	EA	25	290	11500.00
346	pure	0	450	3	Pt	0.25	1	MeOH	40	540	11800.00
347	Ag	0.01	0	0	none	0	0.025	Na ₂ S/Na ₂ SO ₃	0	254	11963.00
348	pure	0	400	2	Au	0.6	0.15	MeOH	10	500	12500.00
349	Eu	0.02	450	2	none	0	0.25	Na ₂ S/Na ₂ SO ₃	0	590	13000.00
350	Ag	0.01	0	0	none	0	0.015	Na ₂ S/Na ₂ SO ₃	0	254	13143.00
351	N	0.304	600	15	Pd	1	0.1	EA	50	256	13500.00
352	W	0.1	350	3	none	0	0.5	EA	10	290	14500.00
353	pure	0	350	2	Au	1	0.325	EA	10	365	15100.00
354	N	0.255	600	12	Pd	1	0.1	EA	50	256	15300.00
355	N	0.304	600	15	Pt	1	0.1	EA	50	256	15500.00
356	pure	0	500	2	Cu	0.5	0.77	MeOH	20	540	15620.00
357	pure	0	350	2	Pd	0.5	0.325	IPA	10	365	16200.00
358	pure	0	500	2	Cu	0.05	0.77	MeOH	20	540	16340.00
359	pure	0	0	0	Pt	2	1	MeOH	25	290	16400.00
360	pure	0	350	2	Pd	1	0.325	IPA	10	365	17000.00
361	pure	0	350	2	Pt	1	0.325	MeOH	10	365	17400.00
362	pure	0	350	2	Au	1	0.325	MeOH	10	365	17600.00
363	Sn	0.017	180	12	Pt	1	0.25	TEA	10	500	17900.00
364	Cu	0.08	450	4	none	0	1	MeOH	10	500	18000.00
365	pure	0	350	2	Pt	1	0.325	EA	10	365	18200.00
366	Sr	0.3	550	3	Pt	0	0.33	TEA	10	500	19442.00
367	Sn	0.034	180	12	Pt	1	0.25	TEA	10	500	19500.00
368	pure	0	500	2	Cu	0.3	0.77	MeOH	20	540	19512.00

369	pure	0	350	2	Au	1	0.325	PG	10	365	19600.00
370	pure	0	0	0	Pt	1	1	MeOH	50	290	20000.00
371	pure	0	500	2	Cu	0.1	0.77	MeOH	20	540	20476.00
372	pure	0	350	2	Pt	1	0.325	PG	10	365	20600.00
373	pure	0	350	2	Pd	0.5	0.325	EA	10	365	21000.00
374	pure	0	350	2	Pt	1	0.325	EG	10	365	21900.00
375	pure	0	400	2	Pt	0.6	0.15	MeOH	10	500	21900.00
376	N	0.255	600	12	Pt	1	0.1	EA	50	256	22500.00
377	pure	0	500	2	Pt	1	0.77	MeOH	20	540	23234.00
378	pure	0	350	2	Au	1	0.325	EG	10	365	23400.00
379	Ag	0.01	0	0	none	0	0.02	Na ₂ S/Na ₂ SO ₃	0	254	23496.00
380	Sn	0.017	180	12	Pt	1	0.25	TEA	10	500	24000.00
381	Sn	0.051	180	12	Pt	1	0.25	TEA	10	500	25100.00
382	pure	0	350	2	Pd	0.5	0.325	MeOH	10	365	25400.00
383	Sn	0.102	180	12	Pt	1	0.25	TEA	10	500	25400.00
384	pure	0	350	2	Pd	1	0.325	EA	10	365	26400.00
385	pure	0	350	2	Pt	1	0.325	Gly	10	365	27100.00
386	pure	0	600	2	Pt	1	0.5	MeOH	10	290	29333.00
387	pure	0	350	2	Au	1	0.325	Gly	10	365	29800.00
388	pure	0	350	2	Pd	0.5	0.325	PG	10	365	30800.00
389	pure	0	350	2	Pd	1	0.325	MeOH	10	365	31300.00
390	pure	0	500	2	Au	2	1	MeOH	25	400	31320.00
391	pure	0	350	2	Pd	1	0.325	PG	10	365	32400.00
392	pure	0	350	2	Pd	0.5	0.325	EG	10	365	34700.00
393	Sn	0.034	180	12	Pt	1	0.25	TEA	10	500	34700.00
394	Sn	0.051	180	12	Pt	1	0.25	TEA	10	500	38100.00
395	Sn	0.102	180	12	Pt	1	0.25	TEA	10	500	39400.00
396	pure	0	350	2	Pd	0.5	0.325	Gly	10	365	41100.00
397	pure	0	500	2	Au	1	1	MeOH	25	400	43920.00
398	pure	0	350	2	Pd	1	0.325	EG	10	365	44500.00
399	pure	0	600	2	Pt	0.75	0.5	MeOH	10	290	45067.00
400	pure	0	600	2	Pt	0.5	0.5	MeOH	10	290	46667.00
401	pure	0	350	2	Pd	1	0.325	Gly	10	365	47500.00
402	pure	0	600	2	Pt	0.75	0.5	MeOH	10	290	49933.00

Physicochemical characteristics of the doped elements:

(de_1: Period, de_2: Classification, de_3: Ionic valence, de_4: Ionic radius (pm), de_5: Covalent radius, de_6: Atomic weight, de_7: Density(g/cm³), de_8: Melting point (°C), de_9: Boiling point (°C), de_10: Heat of fusion (KJ/mol), de_11: Heat of vaporization, de_12: Thermal conductivity ((W/m)/K), de_13: Ionization Energy I, de_14: Ionization Energy II, de_15: Electronegativity)

	de_1	de_2	de_3	de_4	de_5	de_6	de_7	de_8
Be	2	Alkaline Earth	2	45	102	9	1.85	1287
C	2	Non-metal	-4	260	75	12	2.26	3550
N	2	Non-metal	-3	146	71	14	0.808	-210
F	2	Halogen	-1	133	64	19	1.505	-219.61
Na	3	Alkali Metal	1	102	155	23	0.97	97.82
Mg	3	Alkaline Earth	2	72	139	24.3	1.74	651
Al	3	Other Metals	3	53.5	126	27	2.7	660.32
P	3	Non-metal	5	38	111	31	2.34	597
S	3	Non-metal	-2	184	103	32	1.92	106.8
K	4	Alkali Metal	1	138	196	39	0.89	63.38
Ca	4	Alkaline Earth	2	100	171	40	1.55	842
Mn	4	Transition Metal	2	83	119	55	7.21	1244
Fe	4	Transition Metal	3	65	116	55.9	7.86	1535
Co	4	Transition Metal	2	75	111	59	8.9	1494
Ni	4	Transition Metal	2	69	110	58.7	8.91	1453
Cu	4	Transition Metal	2	73	112	63.6	8.96	1084.6
Zn	4	Transition Metal	2	74	118	65.4	7.14	419.53
Sr	5	Alkaline Earth	2	118	185	87.6	2.64	757
Nb	5	Transition Metal	5	64	147	93	8.57	2468
Ru	5	Transition Metal	4	62	125	101.1	12.45	2334
Pd	5	Transition Metal	2	86	120	106.4	12.02	1555
Ag	5	Transition Metal	1	115	128	107.9	10.49	961.78
In	5	Other Metals	3	80	142	114.8	7.31	156.6
Sn	5	Other Metals	4	69	140	118.7	7.26	231.93
Sn	5	Other Metals	2	118	140	118.7	7.26	231.93
Ba	6	Alkaline Earth	2	136	196	137.3	3.51	726.9
La	6	Rare Earth	3	103	180	138.9	6.16	920
Ce	L	Rare Earth	3	102	163	140.1	6.77	795
Nd	L	Rare Earth	3	98.3	174	144.2	7.01	1024
Eu	L	Rare Earth	3	95	168	152	5.24	822
Gd	L	Rare Earth	3	94	169	157.3	7.9	1312
Er	L	Rare Earth	3	89	165	167.3	9.07	1529
W	6	Transition Metal	6	60	137	183.8	19.25	3387
Pt	6	Transition Metal	4	62.5	123	195.1	21.09	1769

Bi	6	Other Metals	3	103	151	209	9.78	271.5
Cr	4	Transition Metal	3	61.5	139	52	7.15	1907

	de_9	de_10	de_11	de_12	de_13	de_14	de_15
Be	2467	7.9	297	200	899	1757	1.57
C	4827	117		155	1086	2353	2.55
N	-196	0.72	5.58	0.02598	1402	2856	3.04
F	-188.13	0.51	6.62	0.0279	1681	3374	3.9
Na	881.4	2.6	97.42	141	496	4562	0.93
Mg	1100	8.48	128	156	738	1451	1.31
Al	2518	10.7	294	237	578	1817	1.61
P	280		0.66	0.235	1012	1903	2.19
S	444.72	1.73	45	0.269	1000	2251	2.58
K	759	2.32	76.9	102.5	419	3051	0.82
Ca	1484	8.54	154.7	200	590	1145	1
Mn	2095	12.9	221	7.82	717	1509	1.55
Fe	2861	13.81	340	80.2	759	1561	1.83
Co	2927	16.2	377	100	758	1646	1.88
Ni	2884	17.48	377.5	90.7	737	1753	1.91
Cu	2561.5	13.26	300.4	401	745	1958	1.9
Zn	907	7.32	123.6	116	906	1733	1.65
Sr	1366	7.43	136.9	35.3	549	1064	0.95
Nb	4860	30	689.9	53.7	664	1382	1.6
Ru	4150	38.59	591.6	117	711	1617	2.2
Pd	3167	16.74	362	71.8	805	1875	2.2
Ag	2164	11.95	258	429	731	2073	1.93
In	2072	3.28	231.8	81.6	558	1821	1.78
Sn	2602	7.03	296.1	66.6	709	1412	1.96
Sb	2602	7.03	296.1	66.6	709	1412	1.96
Ba	1845	7.12	140.3	18.4	503	965	0.89
La	3464	6.2	402.1	13.5	538	1067	1,1
Ce	3440	5.46	398	11.4	528	1047	1.12
Nd	3074	7.14	289	16.5	530	1035	1.14
Eu	1527	9.21	176	13.9	547	1085	
Gd	3273	10.05	301.3	10.6	592	1167	1.2
Er	2868	19.9	280	14.3	589	1151	1.24
W	5900	52.31	806.7	174	770	1700	1.7
Pt	3824	22.17	469	71.6	870	1791	2.2
Bi	1564	11.3	151	7.87	703	1610	1.9
Cr	2944	21	347	93.7	652.9	1590.6	1.66

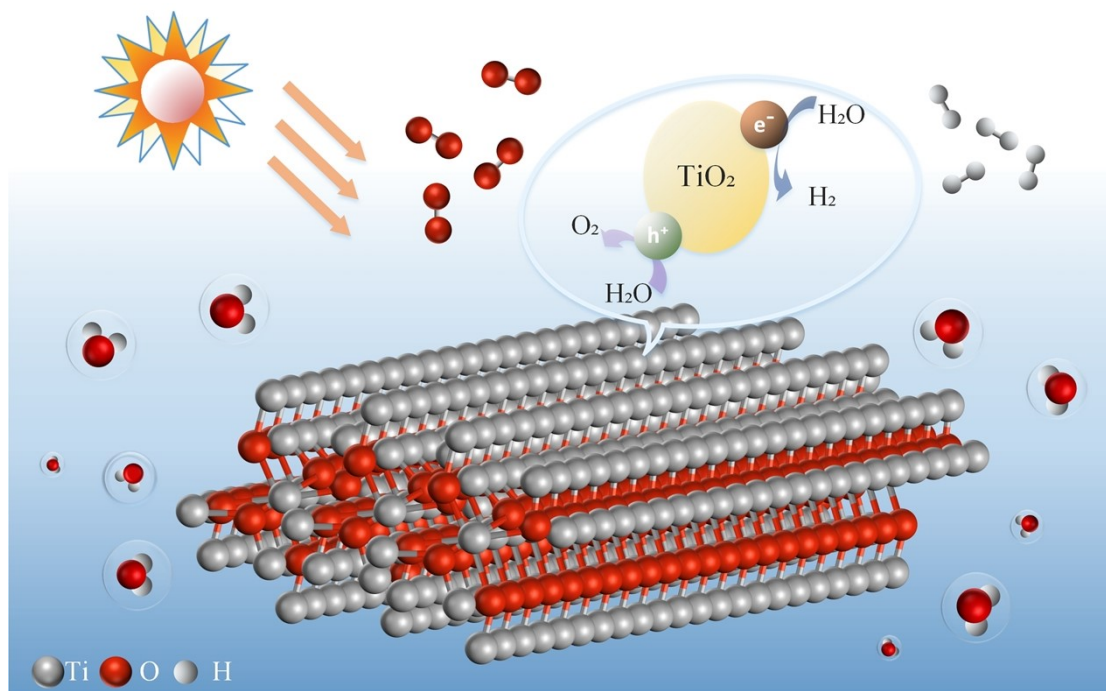


Figure S1. The schematic diagram of TiO₂ photocatalytic water splitting for hydrogen production.

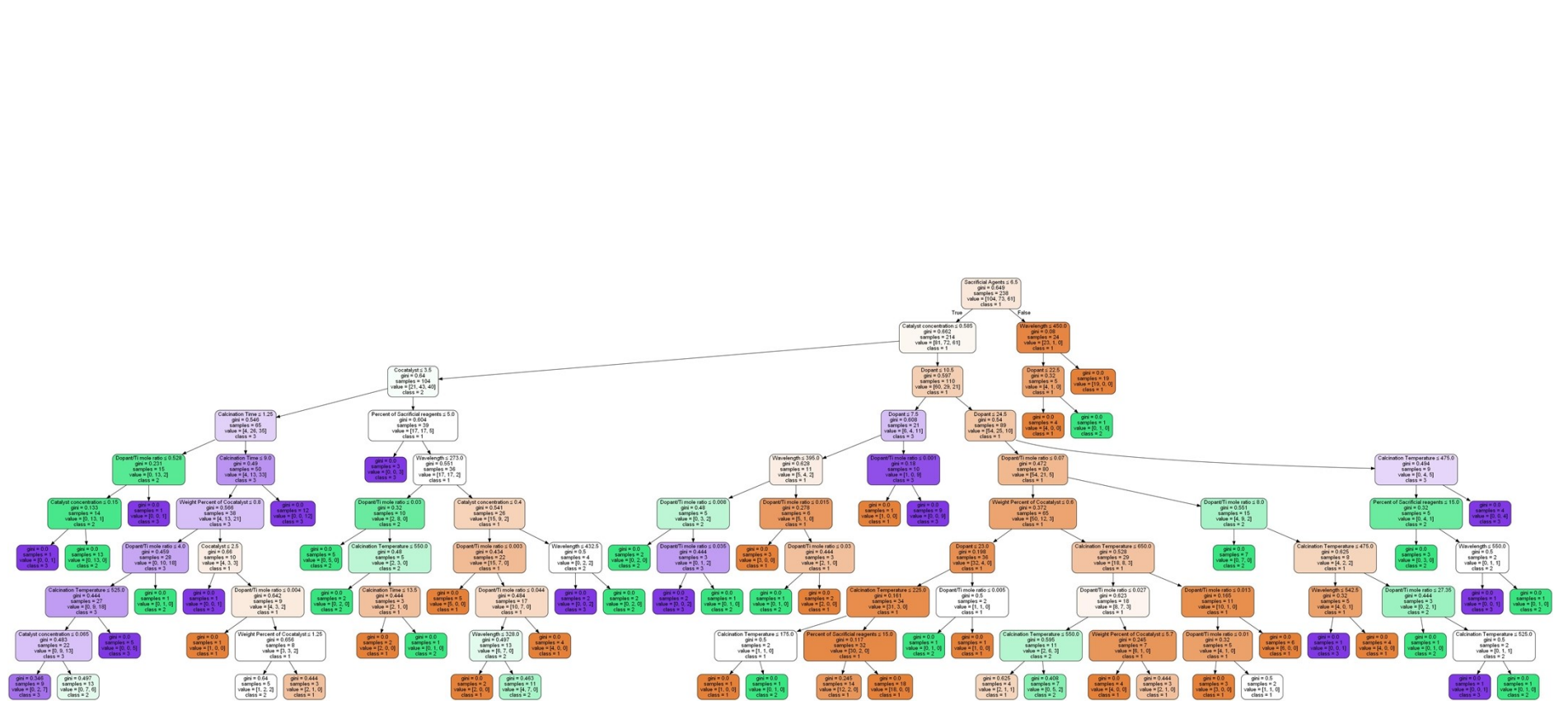


Figure S2. Decision tree classification of hydrogen production rate.