

# Prioritizing Asthma Treatment Drugs Through Multi-Criteria Decision Making

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**Table 1.1:** Initial input matrix with weights assignments and classifying chemical indices as beneficial and non-beneficial criteria (Flash Point Case).

	NB	B	B	B	NB	NB	NB	NB	NB	NB
<b>Weights</b>	0.0901	0.125	0.130	0.121	0.092	0.079	0.081	0.120	0.083	0.0811
	ABC(G)	GA(G)	SCI(G)	RR(G)	R(G)	F(G)	HM(G)	H(G)	M1(G)	M2(G)
<b>Toreforant</b>	22.902	31.100	14.683	75.019	13.991	394	754	13.530	154	180
<b>Bedoradrine</b>	23.720	31.930	15.313	75.716	14.867	396	754	14.300	156	179
<b>Abediterol</b>	25.171	33.949	16.338	79.534	15.882	418	792	15.352	164	187
<b>Fevipiprant</b>	22.836	35.175	13.861	74.619	13.392	452	826	12.471	158	187
<b>Setipipran</b>	24.115	33.181	15.435	82.221	14.525	440	850	14.100	168	205
<b>Ramatroban</b>	23.120	30.754	14.588	75.615	14.017	421	791	13.386	157	185
<b>Zafirlukast</b>	32.271	43.495	20.546	106.524	19.640	582	1102	18.886	220	260
<b>Pranlukast</b>	28.300	39.368	18.591	92.555	17.670	464	902	17.366	188	219
<b>Montelukast</b>	32.442	43.355	20.522	105.964	19.600	588	1100	18.819	220	256
<b>Vilanterol</b>	23.610	32.225	15.735	72.388	15.524	354	682	15.100	148	164
<b>Indacaterol</b>	22.713	31.120	14.654	76.115	13.995	406	780	13.533	156	187
<b>Olodaterol</b>	21.738	28.723	13.721	70.010	13.270	390	726	12.633	146	168
<b>Formoterol</b>	18.632	25.201	12.232	58.317	12.028	298	568	11.600	120	135
<b>Salmeterol</b>	22.058	30.493	14.919	66.924	14.703	314	610	14.433	136	148
<b>Terbutaline</b>	12.078	14.799	7.289	36.171	7.277	218	386	6.666	78	84
<b>Salbutamol</b>	12.635	15.896	7.827	38.404	7.832	226	406	7.266	82	90

<b>Metaproterenol</b>	11.113	14.168	6.986	33.256	6.986	180	332	6.533	70	76
<b>Isoproterenol</b>	11.073	14.209	6.999	33.357	7.003	180	334	6.566	70	77
<b>Epinephrine</b>	9.440	12.440	6.130	28.858	6.147	152	286	5.833	60	67
<b>Ideal Best</b>	9.440	43.495	20.546	106.524	6.968	152	286	6.533	60	67
<b>Ideal Worst</b>	32.442	14.168	6.130	33.256	19.640	588	1102	18.886	220	260

**Table 1.2:** Computation of  $D_j$  and  $B_j$  for Flash Point.

Toreforant	0.053	0.050	0.053	0.049	0.053	0.044	0.047	0.071	0.049	0.048
Bedoradrine	0.056	0.046	0.047	0.048	0.059	0.044	0.047	0.078	0.050	0.047
Abediterol	0.062	0.038	0.038	0.042	0.066	0.048	0.050	0.088	0.054	0.050
Fevipirant	0.053	0.033	0.060	0.050	0.049	0.054	0.054	0.061	0.051	0.050
Setipipran	0.058	0.041	0.046	0.038	0.057	0.052	0.056	0.076	0.056	0.058
Ramatroban	0.054	0.051	0.054	0.048	0.053	0.049	0.050	0.069	0.050	0.050
Zafirlukast	0.089	0.000	0.000	0.000	0.092	0.078	0.081	0.120	0.083	0.081
Pranlukast	0.074	0.017	0.018	0.022	0.078	0.057	0.061	0.106	0.066	0.064
Montelukast	0.090	0.001	0.000	0.001	0.091	0.079	0.081	0.119	0.083	0.079
Vilanterol	0.056	0.045	0.043	0.053	0.064	0.037	0.039	0.085	0.045	0.041
Indacaterol	0.052	0.050	0.052	0.047	0.053	0.046	0.049	0.071	0.050	0.050
Olodaterol	0.048	0.059	0.061	0.057	0.048	0.043	0.044	0.063	0.044	0.042
Formoterol	0.036	0.073	0.075	0.075	0.040	0.027	0.028	0.053	0.031	0.029
Salmeterol	0.049	0.052	0.051	0.062	0.058	0.029	0.032	0.079	0.039	0.034

Terbutaline	0.010	0.115	0.119	0.109	0.008	0.012	0.010	0.008	0.009	0.007
Salbutamol	0.013	0.111	0.114	0.106	0.011	0.013	0.012	0.013	0.011	0.010
Metaproterenol	0.007	0.118	0.122	0.114	0.006	0.005	0.005	0.006	0.005	0.004
Isoproterenol	0.006	0.117	0.122	0.114	0.006	0.005	0.005	0.007	0.005	0.004
Epinephrine	0.000	0.125	0.130	0.121	0.000	0.000	0.000	0.000	0.000	0.000

**Table 2.1:** Initial input matrix with weights assignments and classifying chemical indices as beneficial and non-beneficial criteria (Boiling Point Case).

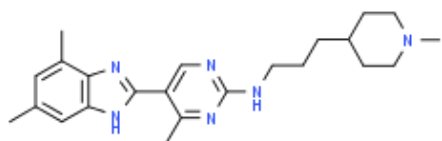
	B	B	B	B	B	NB	NB	NB	B	NB
<b>Weights</b>	<b>0.120</b>	<b>0.092</b>	<b>0.125</b>	<b>0.130</b>	<b>0.090</b>	<b>0.079</b>	<b>0.081</b>	<b>0.081</b>	<b>0.121</b>	<b>0.083</b>
	ABC(G)	GA(G)	SCI(G)	RR(G)	R(G)	F(G)	HM(G)	H(G)	M1(G)	M2(G)
<b>Toreforant</b>	22.902	31.100	14.683	75.019	13.991	394	754	13.53	154	180
<b>Bedoradrine</b>	23.720	31.930	15.313	75.716	14.867	396	754	14.3	156	179
<b>Abediterol</b>	25.171	33.949	16.338	79.534	15.882	418	792	15.352	164	187
<b>Fevipirant</b>	22.836	35.175	13.861	74.619	13.392	452	826	12.471	158	187
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<b>Isoproterenol</b>	11.073	14.209	6.999	33.357	7.003	180	334	6.566	70	77
<b>Epinephrine</b>	9.440	12.440	6.130	28.858	6.147	152	286	5.833	60	67
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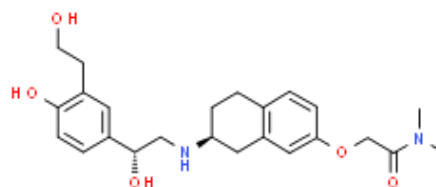
**Table 2.2:** Computation of  $D_j$  and  $B_j$  for Boiling point.

Toreforant	0.050	0.039	0.051	0.056	0.040	0.044	0.047	0.046	0.050	0.048
Bedoradrine	0.046	0.036	0.045	0.055	0.034	0.044	0.046	0.051	0.048	0.048
Abediterol	0.038	0.030	0.036	0.048	0.027	0.048	0.050	0.058	0.042	0.051
Fevipirant	0.050	0.026	0.058	0.056	0.045	0.054	0.054	0.039	0.047	0.051
Setipipran	0.043	0.032	0.044	0.043	0.036	0.052	0.056	0.050	0.039	0.059
Ramatroban	0.049	0.040	0.052	0.055	0.040	0.049	0.0502	0.045	0.048	0.051
Zafirlukast	0.001	0.000	0.000	0.000	0.000	0.078	0.081	0.081	0.000	0.083
Pranlukast	0.022	0.013	0.017	0.025	0.014	0.057	0.061	0.071	0.024	0.065
Montelukast	0.000	0.001	0.000	0.001	0.000	0.079	0.081	0.081	0.000	0.081
Vilanterol	0.046	0.035	0.042	0.060	0.029	0.036	0.039	0.056	0.054	0.042

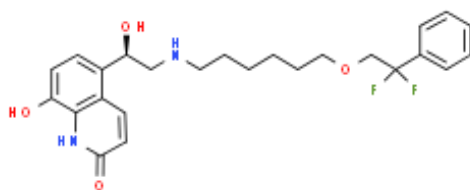
Indacaterol	0.051	0.039	0.051	0.054	0.040	0.046	0.049	0.046	0.048	0.051
Olodaterol	0.056	0.046	0.059	0.065	0.045	0.043	0.044	0.040	0.056	0.043
Formoterol	0.072	0.057	0.072	0.085	0.054	0.027	0.028	0.033	0.076	0.029
Salmeterol	0.054	0.041	0.049	0.070	0.035	0.029	0.032	0.052	0.063	0.035
Terbutaline	0.106	0.090	0.115	0.124	0.088	0.012	0.010	0.001	0.107	0.007
Salbutamol	0.103	0.086	0.110	0.121	0.084	0.013	0.012	0.005	0.104	0.010
Metaproterenol	0.111	0.092	0.117	0.130	0.090	0.005	0.005	0.000	0.113	0.004
Isoproterenol	0.112	0.091	0.117	0.129	0.090	0.005	0.005	0.000217	0.113	0.004
Epinephrine	0.120	0.097	0.125	0.137	0.096	0.000	0.000	-0.005	0.121	0.000



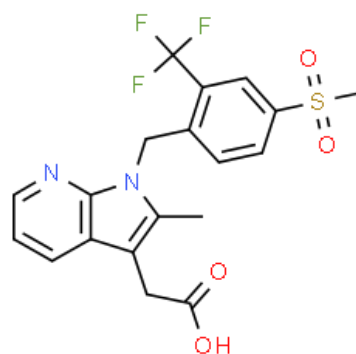
(a) Toreforant



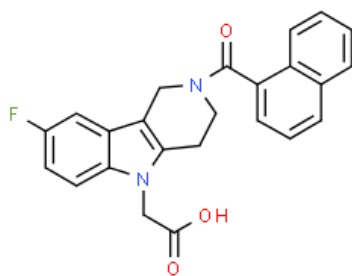
(b) Bedoradrine



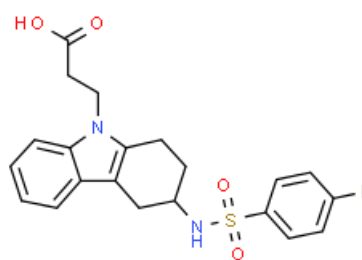
(c) Abediterol



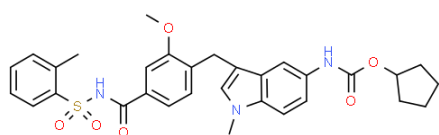
(d) Fevipiprant



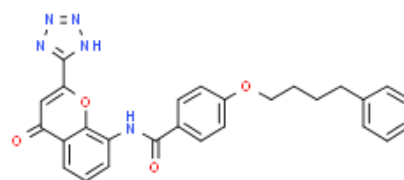
(e) Setipiprant



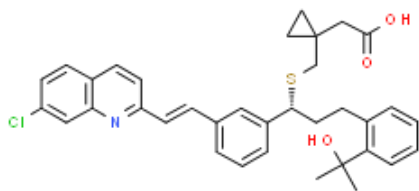
(f) Ramatroban



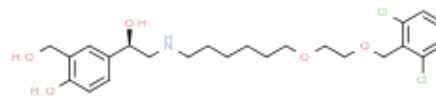
(g) Zafirlukast



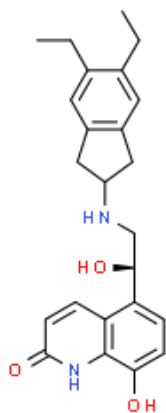
(h) Pranlukast



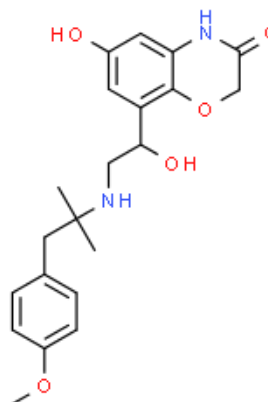
(i) Montelukast



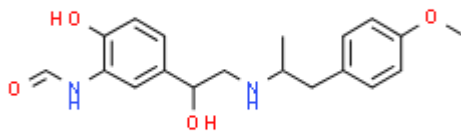
(j) Vilanterol



(k) Indacaterol



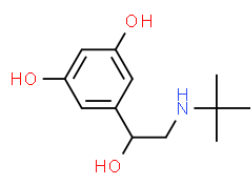
(l) Olodaterol



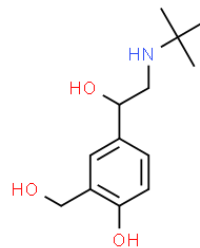
(m) Formoterol



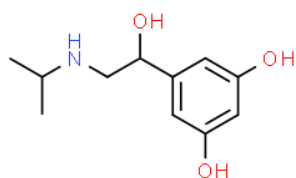
(n) Salmeterol



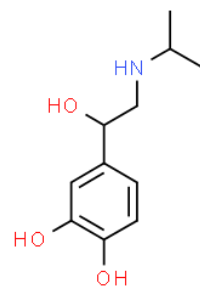
(o) Terbutaline



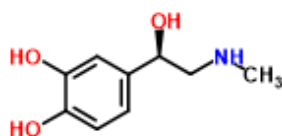
(p) Salbutamol



(q) Metaproterenol



(r) Isoproterenol



(s) Epinephrine

**Figure 1.1:** Structure of numerous key asthma drugs used in COVID-19.