

**CARBON MATERIALS FOR THE  
METALLURGICAL INDUSTRY  
PHYSICAL AND CHEMICAL PROPERTIES**

**Calibration Standards for Impurities by XRF Spectrometry**

	S	Ni	Si	Fe	Al	Na	Ca	P	K	Mg	Cl	Pb	Zn	Cr	Mn	Ti
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
<b>P601</b>	<b>0.62</b>	<b>3.7</b>	<b>89</b>	<b>213</b>	<b>38</b>	<b>26</b>	<b>47</b>	<b>3.0</b>	<b>9.8</b>	<b>8.0</b>	<b>134<sup>(1)</sup></b>	<b>430</b>	<b>636</b>	<b>0.8</b>	<b>2.8</b>	<b>2.5</b>
CI 95%	0.02	1.0	3	5	8	7	3	-	-	-	-	17	12	-	0.2	-
<b>P602</b>	<b>0.59</b>	<b>3.8</b>	<b>109</b>	<b>144</b>	<b>60</b>	<b>504</b>	<b>63</b>	<b>8.3</b>	<b>11.5</b>	<b>8.0</b>	<b>564<sup>(1)</sup></b>	<b>393</b>	<b>518</b>	<b>1.0</b>	<b>3.0</b>	<b>4.6</b>
CI 95%	0.01	0.9	8	7	3	27	4	1.2	1.0	-	-	30	17	-	0.1	1.0
<b>P603</b>	<b>0.54</b>	<b>2.2</b>	<b>127</b>	<b>109</b>	<b>70</b>	<b>183</b>	<b>26</b>	<b>2.0</b>	<b>8.7</b>	<b>6.0</b>	<b>349<sup>(1)</sup></b>	<b>120</b>	<b>122</b>	<b>0.8</b>	<b>2.4</b>	<b>7.3</b>
CI 95%	0.06	0.7	4	7	4	13	5	0.5	1.1	-	-	10	4	-	0.4	1.2
<b>P604</b>	<b>0.49</b>	<b>3.1</b>	<b>62</b>	<b>169</b>	<b>38</b>	<b>246<sup>(2)</sup></b>	<b>94</b>	<b>2.8</b>	<b>5.9</b>	<b>8.8</b>	<b>187<sup>(1)</sup></b>	<b>199</b>	<b>164</b>	<b>1.0</b>	<b>1.9</b>	<b>3.1</b>
CI 95%	0.03	0.8	4	4	10	10	5	0.3	1.0	-	-	6	3	-	0.1	-
<b>P605</b>	<b>0.47<sup>(2)</sup></b>	<b>3.1</b>	<b>55</b>	<b>130</b>	<b>21</b>	<b>362</b>	<b>51<sup>(2)</sup></b>	<b>0.9</b>	<b>6.6</b>	<b>4.5</b>	<b>291<sup>(1)</sup></b>	<b>341</b>	<b>397</b>	<b>0.9</b>	<b>1.9</b>	<b>2.3</b>
CI 95%	0.03	0.6	8	9	8	5	3	0.1	1.1	-	-	15	11	-	0.4	-
<b>P606</b>	<b>0.53</b>	<b>3.1</b>	<b>198</b>	<b>182</b>	<b>104</b>	<b>173</b>	<b>45</b>	<b>3.4</b>	<b>11.5</b>	<b>12.8</b>	<b>182<sup>(1)</sup></b>	<b>130</b>	<b>168</b>	<b>1.1</b>	<b>2.6</b>	<b>9.7</b>
CI 95%	0.03	1.2	4	7	9	11	2	0.5	-	-	-	7	6	-	0.3	0.8
<b>P607</b>	<b>0.52</b>	<b>2.0</b>	<b>231</b>	<b>129</b>	<b>122</b>	<b>175</b>	<b>50</b>	<b>3.9</b>	<b>15.1</b>	<b>20.3</b>	<b>215<sup>(1)</sup></b>	<b>148</b>	<b>208</b>	<b>1.0</b>	<b>3.0</b>	<b>11.5</b>
CI 95%	0.04	0.5	6	2	6	13	4	0.2	1.5	-	-	8	5	-	0.2	1.7
<b>P608</b>	<b>0.47<sup>(2)</sup></b>	<b>2.6</b>	<b>81</b>	<b>84</b>	<b>51</b>	<b>155</b>	<b>50</b>	<b>2.0</b>	<b>3.7</b>	<b>5.8</b>	<b>171<sup>(1)</sup></b>	<b>124</b>	<b>122</b>	<b>0.7</b>	<b>0.9</b>	<b>5.1</b>
CI 95%	0.02	1.1	7	7	11	11	4	0.1	1.0	-	-	8	5	-	0.1	1.3
<b>P609</b>	<b>0.44</b>	<b>3.2</b>	<b>192</b>	<b>92</b>	<b>104</b>	<b>108</b>	<b>32</b>	<b>3.8</b>	<b>12.7</b>	<b>13.3<sup>(2)</sup></b>	<b>111<sup>(1)</sup></b>	<b>75</b>	<b>92</b>	<b>1.0</b>	<b>1.0</b>	<b>11.0</b>
CI 95%	0.04	1.0	4	3	6	8	3	0.3	2.5	-	-	4	3	-	0.1	0.9

(1) : value not certified (measured only by RDC XRF Spectrometry)

(2) : low quality standard for the given impurity

CI 95%: Confidence interval calculated as  $\frac{2\sigma}{\sqrt{n}}$  where  $2\sigma$  is the standard deviation and n the number of laboratories