

# List of Figures

## SECTION-I

### COAL

<i>Fig. No.</i>	<i>Description</i>	<i>Page No.</i>
1	Simplified reaction mechanism for the conversion of coal sulphur to sulphur containing pollutants. ...	5
2.	Global phylogenetic tree showing some of the sulphur metabolizing <i>archaea</i> . ...	14
3a.	Location map of coal and lignite fields in India. ...	35
3b.	Location map of coal in Poland. ...	36
4.	Total cell count vs. time in absence of coal in the media. ...	55
5.	XRD analysis of jarosite precipitates. ...	58
6.	Fe <sup>3+</sup> /Fe <sup>2+</sup> ratio vs. time in absence of coal in the media. ...	59
7.	Total cell count vs. time in presence of coal in the media ...	64
8.	Fe <sup>3+</sup> /Fe <sup>2+</sup> ratio vs. time in presence of coal in the media. ...	64
9.	Total cell count vs. time in presence of increased cell concentration in the inoculum. ...	69
10.	Fe <sup>3+</sup> /Fe <sup>2+</sup> ratio vs. time in presence of increased cell concentration in the inoculum. ...	69
11.	Fe <sup>3+</sup> /Fe <sup>2+</sup> ratio vs. time in bioreactor studies. ...	72
12.	Influence of pulp density on microbial desulphurisation of three coals. ...	81
13.	Influence of particle size on microbial desulphurisation of (a) Assam coal (b) Polish coal (c) Rajasthan lignite ...	83-84

List of Figures (Contd.)

<i>Fig. No.</i>	<i>Description</i>	<i>Page No.</i>
14.	Total sulphur content of lignitic coal as a function of ... desulphurisation time.	91
15.	Kinetic evaluation of sulphur removal from lignitic coal in ... shake flask studies with Tf-R.	91
16.	Total sulphur content of lignite as a function of time in ... bioreactor studies.	94
17.	Kinetic evaluation of sulphur removal from lignitic coal ... with Tf-R in bioreactor studies	94
18.	Suggested mechanism of microbial pyrite oxidation ...	104

**SECTION-II**  
**MANGANESE**

<i>Fig. No.</i>	<i>Description</i>	<i>Page No.</i>
1.	Distribution of manganese ore deposits in India.	128
2.	Oxidation and reduction of MnO <sub>2</sub> .	131
3.	Schematic representation of a model explaining the transfer of reducing power (electrons) across the interface between the cell surface of marine <i>Pseudomonas</i> and surface of MnO <sub>2</sub> particle with which bacteria is in contact.	139
4.	Variation of pH and acidity with time in <i>P. citrinum</i> in shaking condition.	160
5.	Biomass dry weight (g/l) vs. time in <i>P. citrinum</i> shaking and in static condition.	160
6.	Variation of pH and acidity with time in <i>P. citrinum</i> in static condition.	162
7.	XRD analysis of manganese ore.	166
8.	Influence of inoculum size on bioleaching of manganese ore.	173
9.	Percentage of Mn recovery vs. time in (1) in situ leaching, (2) culture filtrate leaching.	173
10.	Plot of function $[1-(1-\alpha)^{1/3}]^2$ vs. time for in-situ leaching.	181
11.	Plot of function $[1-(1-\alpha)^{1/3}]^2$ vs. time for culture filtrate leaching.	181
12.	Plot of function $[1-(1-\alpha)^{1/3}]^2$ vs. time for oxalic acid leaching. (a) Strength of acid -0.05M (b) Strength of acid -0.25M (c) strength of acid -0.5M	182-183

List of Figures (Contd.)

<i>Fig. No.</i>	<i>Description</i>	<i>Page No.</i>
13.	Influence of duration on bioaccumulation of manganese and adsorption of manganese on Mn ore. ...	187
14.	Influence of pH on bioaccumulation of manganese and adsorption of manganese on Mn ore. ...	187
15.	Mechanism showing manganese bioleaching with <i>P. citrinum</i> ...	191
16.	Tentative flow sheet for bioleaching of manganese ore ...	194