

**BIOPOLYMER AND CATION RELEASE IN AEROBIC AND ANAEROBIC
DIGESTION AND THE CONSEQUENT IMPACT ON SLUDGE DEWATERING
AND CONDITIONING PROPERTIES**

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Abstract

Sludge dewatering and chemical conditioning requirements were examined from the perspective of biopolymer and cation release from activated sludge flocs. Both aerobic and anaerobic digestion processes were considered from two different activated sludge sources at a temperature of 20°C. Polymer demand and specific resistance to filtration increased with an increase in total soluble biopolymer concentration for all temperature ranges. In anaerobic digestion, the protein release was three times greater than the polysaccharide release. Conversely, aerobic digestion of the same sludge resulted in a greater release of polysaccharides than proteins. Polymer conditioning requirements in the anaerobic digestors were an order of magnitude higher than in the aerobic digestors; proteins were considered to be the biopolymer fraction responsible for the high polymer conditioning requirements and poor dewatering properties. Biopolymer is released to the supernatant as colloids bound by divalent cations. Peptidase and glucosidase activity were used to monitor enzymatic activity relative to biopolymer release and degradation. The reasons for the increases and decreases in hydrolase activity are unknown.

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CONTENTS

Acknowledgments	iii
Table of Contents	iv
List of Figures	vi
List of Tables	viii
Literature Review	1
Introduction	1
Overview of the Anaerobic and Aerobic Digestion Process	1
Characterization of Activated and Digested Sludge Material.....	2
Impact of Biopolymer on Sludge Dewaterability.....	4
Current Models for Floc Structure	5
Role of Calcium and Magnesium in Floc Disintegration.....	6
Role of Iron in Floc Disintegration	7
Enzymatic Activities of Anaerobically and Aerobically Digested Biosolids.....	7
References	9
Manuscript (Biopolymer and Cation Release in Aerobic and Anaerobic Digestion and the Consequent Impact on Sludge Dewatering and Conditioning Properties).....	11
Literature Review	11
Characterization of activated and digested sludge material	12
Impact of biopolymer on sludge dewaterability	12
Current models for floc structure	13
Methods and Materials.....	13
Experimental approach	13
Sludge matrix	13
Reactor configuration	14
Biopolymer analysis.....	14
Dewatering and conditioning properties.....	14
Ion analysis	15
Ultrafiltration analysis.....	15
Determination of glucosidase activity and alanine-aminopeptidase activity	15
Results and Discussion.....	15
Biopolymer release in aerobic and anaerobic digestion and the effect on dewatering properties	15
Role of calcium and magnesium in floc disintegration	21

CONTENTS continued

Enzymatic activity	26
Proposed floc structure.....	28
Conclusions	28
References	28
Engineering Significance.....	31
Appendix A: The Effects of Temperature on Anaerobic Digestion: Implications for Conditioning and Dewatering.....	33
Appendix B: Raw Data.....	45
Vita.....	69

LIST OF FIGURES

Figure 1: a) Polymer Demand, and b) CST for Blacksburg and Pepper’s Ferry Aerobic and Anaerobic Digestion Study, 20°C.....	16
Figure 2: a) Soluble Protein, and b) Soluble Polysaccharide for Blacksburg and Pepper’s Ferry Aerobic and Anaerobic Digestion, 20°C.....	18
Figure 3: Polymer Demand versus a) Soluble Protein, b) Soluble Polysaccharide, and c) Sum of Soluble Proteins and Polysaccharides for Blacksburg and Pepper’s Ferry Aerobic and Anaerobic Digestion Studies, 20°C	20
Figure 4: Specific Resistance to Filtration versus a) Soluble Protein, and b) Soluble Polysaccharide for Blacksburg and Pepper’s Ferry Aerobic and Anaerobic Digestion Studies, 20°C	21
Figure 5: Dissolved Calcium and Magnesium Concentrations for Blacksburg and Pepper’s Ferry Aerobic Digestion Studies.....	22
Figure 6: Partitioning of Free and Colloidal Calcium Released to the Supernatant for a) Blacksburg, and b) Pepper’s Ferry Aerobic Digestion Study, 20°C	24
Figure 7: Molecular Weight Distributions of a)Soluble Protein, and b) Soluble Polysaccharide for Pepper’s Ferry Digested Biosolids, 38°C	25
Figure 8: An illustration of Floc Deterioration During Digestion	26
Figure 9: Peptidase and Glucosidase Activities for a) Blacksburg and b) Pepper’s Ferry Aerobically Digested Biosolids	27
Figure A1: a) Polymer Demand, and b) Specific Resistance to Filtration versus Total Soluble Biopolymer Concentration for Blacksburg and Pepper’s Ferry Anaerobic Digestion Studies at 30, 38, and 55°C.....	37
Figure A2: a) Polymer Demand, and c) CST for Pepper’s Ferry Anaerobic Digestion Studies; and b) Polymer Demand, and d) CST for Blacksburg Anaerobic Digestion Studies at Temperatures of 30, 38, 55, and 55-36°C	38
Figure A3: a) Protein, and b) Polysaccharide for Pepper’s Ferry Anaerobic Digestion Studies; and c) Protein, and d) Polysaccharide for Blacksburg Anaerobic Digestion Studies at Temperatures of 30, 38, 55, and 55-36°C	39
Figure A4: a) Ammonia, and c) % Volatile Solids Reduction for Pepper’s Ferry Anaerobic Digestion Studies; and b) Ammonia, and d) % Volatile Solids Reduction for Blacksburg Anaerobic Digestion Studies at Temperatures of 30, 38, 55, and 55-36°C.....	41
Figure A5: a) Soluble COD, and c) Acetate for Pepper’s Ferry Anaerobic Digestion Studies; and b) Soluble COD, and d) Acetate for Blacksburg Anaerobic Digestion Studies at Temperatures of 30, 38, 55, and 55-36°C	42
Figure A6: Total Soluble Ferrous Iron Released for Pepper’s Ferry Anaerobic Digestion Studies at Temperatures of 20, 38, and 55°C	42

LIST OF FIGURES continued

Figure B1: Molecular Weight Distributions of a) Protein and b) Polysaccharide for Pepper’s Ferry Anaerobic Digestion Study at 36°C 45

Figure B2: Molecular Weight Distributions of a) Protein and b) Polysaccharide for Blacksburg Anaerobic Digestion Study at 36°C..... 46

Figure B3: Molecular Weight Distributions of a) Protein and b) Polysaccharide for Pepper’s Ferry Anaerobic Digestion Study at 38°C 47

Figure B4: Molecular Weight Distributions of a) Protein and b) Polysaccharide for Blacksburg Anaerobic Digestion Study at 38°C..... 48

Figure B5: Molecular Weight Distributions of a) Protein and b) Polysaccharide for Pepper’s Ferry Anaerobic Digestion Study at 55°C 49

LIST OF TABLES

Table 1: Protein to Polysaccharide Ratios for Blacksburg and Pepper’s Ferry Aerobic and Anaerobic Digestion Studies	18
Table 2: Solution Bound Calcium and Magnesium Relative to the Polysaccharide Concentrations for Blacksburg and Pepper’s Ferry Aerobic Digestion Study, 20°C	23
Table A1: Biopolymer and Ammonia for the I.D.I. Pilot Plant, Indianapolis	40
Table B1: Total, Free, and Bound Calcium and Magnesium, 20°C	50
Table B2: Enzymatic Data, 20°C.....	51
Table B3: CST, SRF, and Polymer Demand, 20°C	51
Table B4: Total Protein, Polysaccharide, and COD, 20°C	52
Table B5: COD, Proteins, Polysaccharides, 20°C	53
Table B6: Calcium, Magnesium, Potassium, Sodium, and Ammonia, 20°C	54
Table B7: Mixed Liqueur and Volatile Suspended Solids, 20°C.....	55
Table B8: Mixed Liquor Suspended and Volatile Solids, 30°C	55
Table B9: Protein, Polysaccharide, Ferrous Iron, and Total Dissolved Iron, 30°C.....	56
Table B10: Polymer Demand, SRF, and CST Data, 30°C.....	57
Table B11: COD and Acetate, 30°C.....	57
Table B12: Cation and Anion Data, 30°C.....	58
Table B13: Total Protein, Polysaccharide, and COD, 30°C	59
Table B14: Protein, Polysaccharide, COD, and Acetate, 38°C.....	60
Table B15: Cation and Anion Data, 38°C.....	60
Table B16: Mixed Liqueur Suspended and Volatile Solids, 38°C.....	61
Table B17: SRF, CST, and Polymer Demand, 38°C	61
Table B18: Total Protein, Polysaccharide, and COD, 38°C	62
Table B19: Protein, Polysaccharide, COD, and Acetate, 55°C.....	62
Table B20: Enzymatic Data, 55°C.....	63
Table B21: Total Protein, Polysaccharide, and COD, 55°C	63
Table B22: Cation Data, 55°C	64
Table B23: Anion Data, 55°C	64
Table B24: Mixed Liqueur Suspended and Volatile Solids, 55°C.....	64
Table B25: Polymer Demand, SRF, and CST, 55°C	65
Table B26: COD, Protein, Polysaccharides, and Acetate, Thermophilic/Mesophilic Study.....	65
Table B27: SRF, Polymer Demand, and CST, Thermophilic/Mesophilic Study.....	65
Table B28: Total Protein, Polysaccharide, and COD, Thermophilic/Mesophilic Study.....	66
Table B29: Mixed Liqueur Suspended and Volatile Solids, Thermophilic/Mesophilic Study.....	66
Table B30: Cation and Anion Data, Thermophilic/Mesophilic Study	66
Table B31: Enzymatic Data, 36°C.....	67
Table B32: Total Protein, Polysaccharide, and COD, 36°C	67
Table B33: COD and Acetate, 36°C.....	68