NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

DEPARTMENT OF APPLIED CHEMISTRY

TITLE OF PROJECT:

THE USE OF POLYELECTROLYTES IN WATER TREATMENT

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ABSTRACT

PROBLEM

During my attachment period with the HARARE CITY COUNCIL, a problem of bulking, which is the carrying over of floc particles from the clarifier at the water treatment works was constantly occurring. Various ways of investigating on how to overcome this problem had to be looked into and the succeeding method had to be reasonable and affordable. The problem of bulking had been resulting in the carrying over of aluminium sulphate into the water mains and resulted in a phenomenon called post-flocculation and also a high aluminium content which is very undesirable.

METHOD OF SOLUTION

Using flocculent aids was one way which was looked into and these flocculent aids were in the form of polyelectrolytes and activated silica. The main flocculating chemical was aluminium sulphate. Employing the standard jar test method numerous tests were carried out on each chemical and its suitability was noted. Various instruments were used, a double beam spectrophotometer, turbid-meter, colourmeter, pH meter and many wet chemistry methods.

OUTCOME

It was found out that anionic polyelectrolytes were better in the process of aiding aluminium sulphate, however activated silica was found to be more suitable as compared to the available polyelectrolytes. The problem of bulking was solved and high

quality water resulted. Besides the dosage of aluminium sulphate was reduced and the overall savings on this reduction realized were in the region of 8%. Moreover activated silica is readily available in Zimbabwe.