

Treatment of Slaughter Water Using Reaction-regulation Integrated

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Abstract: In view of the extension and renovation requirement of a waste water treatment plant, a system with reaction-preparation integrated review loop bioreactor (rpir) as the core technology was used to treat waste water. the operation results showold that, the average removal rates of COD_{Cr}, NH₃-N, TN and TP were 94.1%, 90.1%, 68.4% and 85.9% specially, the average mass concentrations of them were 110.8, 16.0, 3.8 and 81.5 mg/L specially with the annual reduction of 970.9, 80.6, 94.9 and 13.7 t specially. the average mass concentration of SS in effluent water was 17 mg/L. it could be seen that, the COD_{Cr}, NH₃-N and SS concentrations of effluent water were all superior to the requirements of Grade 2 in GB 13457-1992 discharge standard of water polls for meat packaging industry. The SV₃₀Of the rpir aerobic reaction zone was 35%-45%, the mass concentrations of MLSS and MLVSS could remain at about 6 000 and 3 650 mg/L specially. the floor space of rpir biochemical reaction zone of the said new system for one ton water treatment was 0.16 m².

Keywords: reaction-regulation integrated reactor Loop Reactor

Yi,Currently, the water treatment is nearing saturation..Due to the expansion of productionNeed,The plant is in urgent need of new contracts1 500 m³/DWastewater Treatment Facility,And the current factory area is limited,We need to choose a process that covers less land and can guarantee the treatment effect for expansion..

Integrated rectangular loop bioreactor with REACTIVE PRECIPITATION(RpirReactor)Is the author unit early development of the product,The reactor is based on the classical chemical mass transfer theory.[⁴⁻⁷]And previous Basic Research[⁸⁻¹⁰],Cleverly equipped deflector Structure,Improved Oxygen Mass Transfer Efficiency,Boost air,Microbe(Activated Sludge)3-phase contact reaction with water,At the same time, it provided good conditions for the separation of activated sludge and water..RpirThe reactor integrates reaction zone and precipitate zone.,Effective microbes trapped,To maintain a high concentration of activated sludge in the biochemical pool,Therefore, the water retention time is short.,Small footprint,Low Operating Cost[¹¹⁻¹³].

This study is the firstRpirTreatment of Slaughter Wastewater with Reactor,New Processing size is1 500 m³/DWastewater Treatment Facility,Combined with running Data AnalysisRpirTreatment Effect of reactor on Slaughter Wastewater.

1. Process Design and Method

1.1 Design in and out water quality

Final supernatant by precipitation area upper overflow drainSludge Automatic Settlement to reaction zoneResidual Sludge by sludge bucket regular discharge.Reaction Zone under

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The temporary pump from existing sludge concentration pool extraction sludge ZhishengOf Pool.The water dilution sludge after RpirGood oxygen reactor first stuffy exposure 2 DThe first 3Day water from small to big gradually increaseContinuous operation Number of days later activity sludge start gradually increasedIn order to speed up the processAgain batch vote and sludgeIn Sludge Domestication earlyReasonable control aeration.RpirAnaerobic Reactor of Sludge Domestication is for Jane

2. Results and discussions

2.1 NH₃-NRemoval Effect Analysis

New system pairNH₃-NThe removal effect4.Shown.Total Water IntakeNH₃-NHigh Mass Concentration,The average is163.3 mg/L.Waste water passes through the floating pool,RpirAnaerobic Reactor1.,RpirAnaerobic Reactor2.AndRpirAfter treatment in aerobic reactor,EffluentNH₃-NMass Concentration is16.0 mg/L.New system pairNH₃-NThe total removal rate is82.4%~95.9%,Average removal rate90.1%,Annual reductions80.6 T.RpirRemoval of aerobic reactorNH₃-NStrong capability,Mainly in its structural design,Efficient interception of beneficial bacteria,Create an environment conducive to the survival of microbes with long sludge age.Combined with theoretical guidance^[15-16]And on-site operation,In securingNH₃-NA prerequisite for efficient degradation,Guaranteed by regulating Fan FrequencyRpirThe dissolved oxygen concentration in the aerobic reactor was maintained2.0 mg/LCan,Fully realize energy saving,Environmental protection.

New system pairTNThe removal effect5.Shown.Total Water IntakeTNAverage Mass Concentration258.3 mg/L.Raw Water via floating pool,RpirAnaerobic Reactor1.,RpirAnaerobic Reactor2.AndRpirAfter treatment in aerobic reactor,EffluentTNMass Concentration is24.9 ~ 9 ~ 119.5 mg/L,The average is81.5 mg/L.New system pairTNThe average removal rate is68.4%,Annual reductions94.9 t.Usually,Biochemical reaction RemovalTNThe Mechanism isNH₃-NConversion of nitrate nitrogen to nitrogen in anoxic environment^[17].RpirThere was no anoxic process at the front end of the aerobic reactor.,Therefore,Nitrogen Removal Effect is mainly

Already stated in the study,Liu Changqing^[18]ResearchAmonIntegrated Technology andRpirSimilar Reactor Structure,The role of the guide plate will also separate the reactor from the aerobic nitrification zone and the anoxic denitrification zone.,Fang, *et al.*^[19]Promote Intermittent Aeration to create aerobic-Anoxic environment,SimilarRpirAlternation of aeration zone and precipitation Zone,Can strengthen Nitrification and Denitrification.

2.2 TPRemoval Effect Analysis

New system pairTPThe removal effect6.Shown.System InletTPMass Concentration is20.8.~54.4 mg/L,The average is28.8 mg/L.To improve phosphorus removal efficiency,The craft inRpirMiso

SystemTPRemoval Effect and waterTPConcentration andRpirGood oxygen reactor of sludge discharge of frequency have close of correlation.

2.3 SSRemoval Effect Analysis

RpirGood oxygen reactor of waterSSQuality concentration as shown in Figure7/Shown in.WaterSSQuality concentration is far lower than the design value100 mg/LDistribution in10~29 mg/LBetweenAverage17 mg/L.Usually in underWastewater after good oxygen processing afterBack-end need to have enough

Big of sedimentation tank or is long of wastewater stay time to assurance waterHave lowSSValue.RpirThe precipitation area has special of guide plateMake circulation mixture in precipitation area can static of downProvince went to sedimentation tank and structuresGreatly save the covers an area of space?.In System Operation Process inWaterSSConcentration shou hao oxygen area sludge concentration and dissolved oxygen of influence is bigSludge concentration the higher(Field Determination7/500 mg/More),WaterSSConcentration with increased;Dissolved oxygen of quality concentration

3. Economic analysis of system operation

A²O Process is one of the mainstream technologies for the treatment of Slaughter Wastewater^[21-24], The original system of this factory adopts this technology, The effective volume of the biochemical pool is 350 m³, The area of tons of water in biochemical area is 0.29 m². A²O Craft pair COD_{Cr}, NH₃-N The removal effect can up 90% More But its nitrification liquid reflux need to cost is high energy And follow-up of sedimentation tank increase the covers an area Not for use with land area nervous of Waste Water Treatment Plant of expansion Transformation.

Compared in the original system New system biochemical area tons water covers an area

For 0.16 m² For 1 500 m³/DOF wastewater processing scale Can Save Construction Area 212.75 m² Direct save investment 1600f. The original system and new system of biochemical pool power consumption respectively

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