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VINILASETAT ISHLAB CHIQARISH JARAYONINI ANALITIK NAZORAT QILISHNING SAMADORLIGI

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Vinilasetat tarkibida aralashmalar mavjud: 0,005 - 0,03% suv; 0,0025 - 0,005% sirka kislotasi; 0,0025 - 0,0075% asetaldegid; 0,01% metilasetat; 0,0025% etilasetat. Asosiy mahsulotning tarkibi 99,9 wt. %.

Hozirgi vaqtda eng muhim birikma hisoblanadigan vinil monomeri (vinilxloriddan keyin) ikkinchi o'rinda turadi. Uning yillik ishlab chiqarish quvvati 3 million tonnadan oshadi. Qayta ishlashning asosiy yoo'nalishlari polivinilatsetat va polivinil spirtdir. Bundan tashqari, VA polivinil butiral, akril tolalar va boshqalarni olish uchun ishlatiladi etilen va propilen bilan sopolimerlar xosil qiladi. Uni tayyorlashning birinchi sanoat usuli - asetilendan suyuq faza usulidan (1912) 1930 yilda gaz fazali usuliga o'tdi (Vacker).

$C_2H_4 + C3COOH \rightarrow CH_2 = CHOCOCH_3$

Reaksiya T = 180-210 ° C va P = 1 atm da, C≡C ning 2-5 baravar ko'p bo'lgan sharoitida amalga oshiriladi. Katalizatorlar Ng, Zn, Cd asetat shaklida tuzlarini o'z ichiga olgan faol uglevodorodlardir.

Jarayonni bosqichlari quyidagilardan iborat: faollashgan uglerodda katalizator (rux asetat) hosil bo'lishi, katalizatorda asetilenning xemosorbtsiyasi, adsorblangan asetilen bilan CH_3COON ning o'zaro tasiri.

Uning ishlashi juda yuqori : sirka kislotasi uchun VA rentabelligi 97%, asetilen uchun 95% ni tashkil etdi, ammo katalizatorning ishlash muddati 2000 soat dan oshmadi.

Ushbu texnologiya 1960 yilgacha hukmronlik qildi. Ammo etileni arzon yo'l bilan pirolizi paydo bo'lishi bilan asetilen sestiasi asta-sekin o'z o'rnini yoqotishni boshladi. Etilendan ishlab chiqarish usulini (AQSh, Yaponiya, G'arbiy Yevropada) yaaxshi rivojlandi. (ushbu yo'l bilan 90% VA hosil bo'ladi),

$CH_2 = CH_2 + CH_3\text{-}C\text{-}O\text{-}OH + PdC1_2 \rightarrow CH_2 = CH\text{-}O\text{-}CO\text{-}CH_3 + 2HC1 + Pd$ Shuningdek asetaldegid ishlab chiqarishga o'xshash suyuq fazali versiyadan gaz fazali usulga o'tdi.

Katalitikning ishlash printsipi quyidagi tizimda keltirilgan:

$Pd + CuC1_2 \rightarrow PdC1_2 + 2CuC1$

$2CuC1 + 2HC1 + 1/2O_2 \rightarrow 2CuC1_2 + H_2O$

Sirka kislotasining har bir o'tkazuvchanligi 20-30% ni tashkil etdi, etilen 2- 3%, etilen unumi - 70-80%ni tashkil yetadi.

Ammo 1968 yilda VA gaz fazali usullarini ishlab chiqaradigan birinchi zavod (Vauyer-Noyechest texnologiyasi, U.S.I Chyemicals) ishga tushirildi :

$CH_2{=}CH_2 + CH_3\text{-}CO\text{-}OH + 1/2O_2 \rightarrow CH_2{=}CH\text{-}O\text{-}CO\text{-}CH_3 + H_2O$

Reaksiya T = 160-180 ° C va (0,5 ÷ 0,8) -106 Pa da amalga oshiriladi; sanoat katalizatori - Pd qo'llab-quvvatlanadigan va bazan o'zgartirilgan qo'llab-quvvatlash; asosiy metall va katalizatorning tarkibi mos ravishda 1-3% va 0,2-2% ni tashkil qiladi Al_2O_3 tashuvchi sifatida ishlatiladi; C_2N_4 konversiyasi - 8-12%; S = 92%. Asosiy mahsulotlar: 7,5% - CO_2; 0,5% etil asetat va asetaldegid.

VA [1] ni sintez qilish texnologiyasining boshqa versiyalarini ishlab chiqishga harakat qilindi, masalan, sirka angidrid va asetaldegid asosida:

$CH_3\text{-}CHO + (CH_3\text{-}CO)_2O \rightarrow CH_3\text{-}CH(O\text{-}CO\text{-}CH_3)_2$

etiliden diasetat

$CH_3\text{-}CH(O\text{-}CO\text{-}CH_3)_2 \rightarrow CH3COOH + CH2{=}CH\text{-}O\text{-}CO\text{-}CH_3$

1953 yilda hatto Texasda (Cyelanyesye) ishlab chiqarishi 20 ming tonnali zavod qurildi, ammo tezda to'xtab qoldi.

Nalcon kompaniyasi VA olish usulini ishlab chiqishda davom etmoqda

metil asetatning sopolimirlanishi.

Xomashyo metanol metil asetat va sirka angidrididan ketma-ket olinadigan sintez gazidir. Jarayonning asosiy bosqichi karbonildir metil asetat metilatsiyasidir:

CH_3-CO-O-CH_3 +CO→(CH_3-CO)$_2$O

(CH_3-CO)$_2$O+CH_3-CO-O-CH_3CO +H_2 → CH_3-CH(O-CO-CH_3)$_2$ + CH_3COOH

Umumiy reaksiya quyidagicha:

4CO + 5 H_2 → CH_2=CH-O-CO-CH_3 + 2H_2O

Xuddi shu kompaniya (Nalcon) VA ni etilen glikol diasetatni piroliz qilish bilan olishni taklif qildi:

CH_3-O-CO-CH_2-CH_2-O-CO-CH_3 → CH_2=CH-O-CO-CH_3+ CH_3COOH

3 CH_2=CH_2 + 5CH_3COOH→ CH_3-O-CO-CH_2-CH_2-O-CO-CH_3 + HO-CH_2- CH_2-O-CO CH3+ 2 H_2O

Yuqoridagilardan kelib chiqadiki, VA olish usullarini ishlab chiqish jarayonida turli xil texnologik variantlar taklif qilingan [1-9]. Ammo, hozirgi vaqtda etilen asetoksillanishining gaz fazali (bug fazali) usuli ustunlik qilmoqda, uning asosiy afzalligi etilenning asetilen bilan taqqoslaganda arzonligi,va shuningdek jarayonni jadal o'tkazish imkoniyati katta va ishlabchiqarish quvvati yiliga 50-150 ming tonna.

Ko'p sonli adabiyot manbalariga ko'ra, bu jarayon platinaviy guruhning metall holatidagi yoki tuzlar ko'rinishidagi metallar tomonidan katalizlanib, har xil g'ovak tayanchlarga yotqizilishi mumkin.

Malumki metall palladiy bir qator olefin oksidlanish reaksiyalari uchun juda faol katalizator hisoblanadi. Olefin molekulasidan vodorodni siqib chiqarish qobiliyatiga ega.

Foydalanilgan adabiyotlar.

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UTILIZING GREEN CHEMISTRY IN CONSTRUCTED WETLANDS: MECHANISMS FOR PHARMACEUTICAL COMPOUND REMOVAL

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Abstract: This report delves into the innovative approach of integrating green chemistry principles within constructed wetlands to efficiently remove pharmaceutical compounds from wastewater. By examining the mechanisms involved, this study explores the synergistic relationship between green chemistry and constructed wetlands, offering a sustainable solution for mitigating pharmaceutical pollution in aquatic environments.

Introduction: Constructed wetlands have been created through human creativity, natural water treatment processes, and habitat building. To treat wastewater, humans plan, construct, and manage constructed wetlands.). Pharmaceutical wastewater treatment systems sometimes combine many process technologies and are flexible and extensible. Antibiotic pharmaceutical active compounds are known to pose a serious risk to environment and human health due to bio-magnification and bioaccumulation (Yujue, et al. 2019). Pharmaceutical active compounds have reportedly been linked to infertility, sexual dysfunction, and the spread of bacterial resistance in human and aquatic creatures. Hospitals and healthcare facilities, which have been largely disregarded in studies, are another point source of pharmaceutical chemicals (Khan et al., 2020).