5-XLORIZOBENZOFURAN-1,3-DION SINTEZI VA UNING XROMATO-MASS TAHLILI

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Annotatsiya:Bugungi kunda kimyo sanoati qurilmalarining eskirishini oldini olish va ekspluatatsion barqarorligini ta'minlash maqsadida galogen saqlovchi organik birikmalarini o'z ichiga olgan va raqobatbardosh muqobil mahsulot ishlab chiqarishga alohida e'tibor berilmoqda. Bu maqolada ftal angidridning xlorli hosilasini olish bo'yicha reaksiya mexanizmlari va xromato-mass tahlil natijalari keltirilgan.

Kalit so'zlar: galogenlash, erituvchi, reaksiya mexanizmi, dimetilformamid (DMF), ftalik angidrid, xlorlash, xromato-mass spektr.

Аннотация:Сегодня особое внимание уделяется производству конкурентоспособной альтернативной продукции, содержащей галогенсохраняющие органические соединения, с целью предотвращения износа оборудования химической промышленности и обеспечения стабильности его работы. В статье представлены механизмы реакции и результаты хромато-массового анализа получения хлорпроизводного фталевого ангидрида.

Ключевые слова: галогенирование, растворитель, механизмы реакции, диметилформамид (ДМФ), фталевый ангидрид, хлорирование, хромато-масс-спектр.

Abstract: Today, special attention is paid to the production of competitive alternative products containing halogen-preserving organic compounds in order to prevent wear of chemical industry equipment and ensure the stability of its operation. The article presents the reaction mechanisms and the results of chromatographic mass analysis of the production of a chlorine derivative of phthalic anhydride.

Key words: halogenation, solvent, reaction mechanisms, dimethylformamide (DMF), phthalic anhydride, chlorination, chromatograph mass spectrum.

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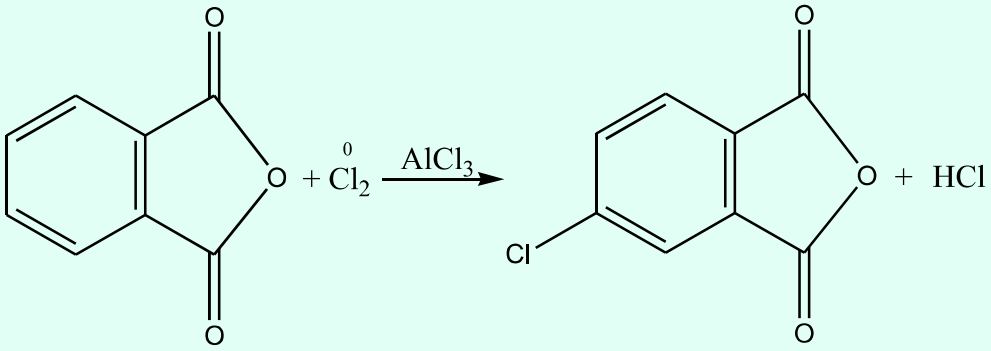
Kislota angidridlariga galogenlarning birikish reaksiyasi tadqiq qilinmaganligi sababli ushbu angidridlarning galogenli hosilalarini olish muhim ahamiyat kasb etadi. Bunday moddalar kimyo sanoati va qishloq xo'jaligida muhim o'rin egallaydi.

Ftal angidrid va xlor atomining ta'sirlashuvi geterogen sistemada boradi. Reaksiya jarayoni borayotgan reaktorning harorati oshirilganda, reaksiyaga kirishayotgan moddalar zarrachalarining harakat tezligi ortadi va bu holat

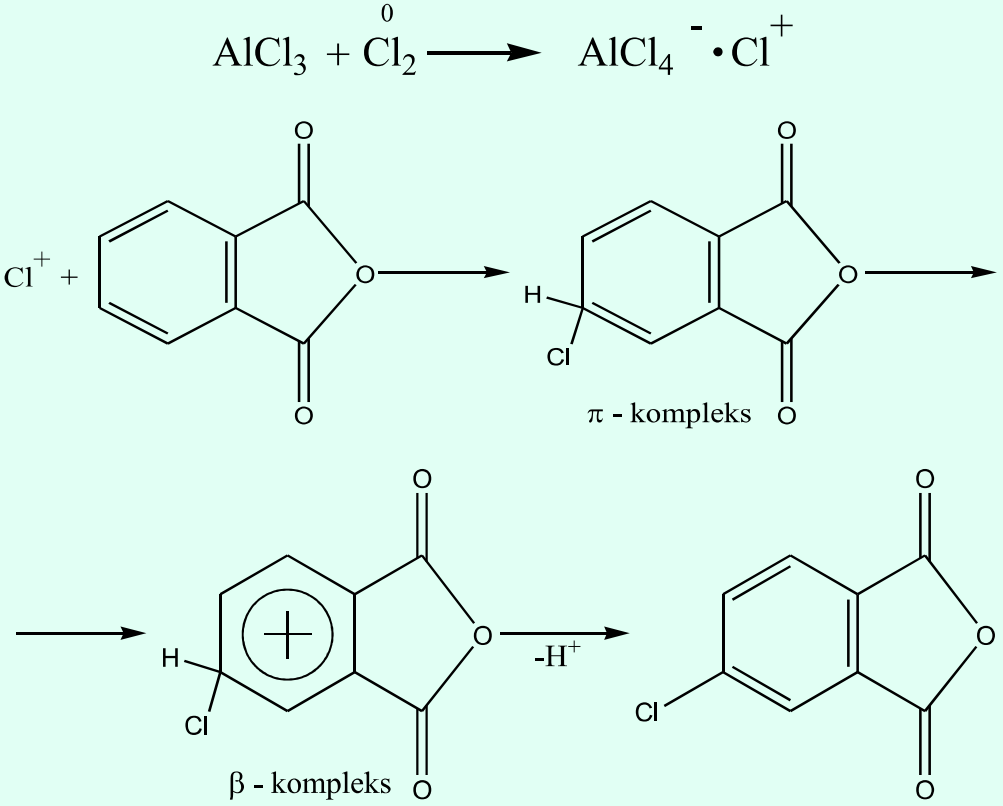
zarrachalarning o‘zaro to‘qnashishlar sonini oshiradi. Natijada maxsulot unumini oshishiga sabab bo‘ladi. Shuningdek o‘ta yuqori haroratda organik moddalarning parchalanishi ham kuzatiladi. Shuning uchun tadqiq qilinayotgan reaksiyaning optimal harorat qiymatini topish muhim hisoblanadi. Reaksiya 80°C da amalga oshirilganda mahsulot unumi maksimal 40,2 % ni tashkil etdi.

ADABIYOTLAR TAHLILI

Ftal angidridga xlorni birikish reaksiya mexanizmi quyidagicha bo’ladi.



Reaksiya S_E2 aromatik mexanizmda boradi. Alyuminiy xlorid xlor atomi bilan kompleks hosil qiladi.

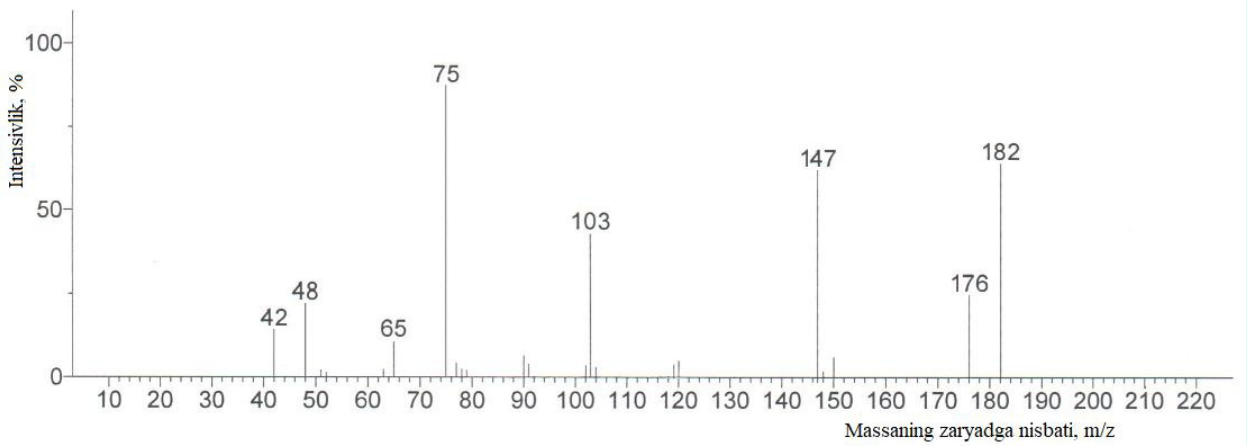


TADQIQOT METODOLOGIYASI

Sintez qilingan moddani molekulyar massasini aniqlash uchun xromato-mass spektr tahlili amalga oshirildi. 5-xlorizobenzofuran-1,3-dionning xromato-mass spektr

(1-rasm) tahlili asosida uning parchalanishdan hosil bo‘lgan ionlarga qarab xulosa chiqarildi.

Xromato-mass spekrtlar standart HP-5MS markali kolonkada suyuq fazada, nazorat parametrlari 0-320 °C oralig‘ida, boshlang‘ich harorat 50 °C dan 120 °C gacha bo‘lgan “Agilent MSD 5975C-GC7890A” xromato-mass-spektrometrlarda olindi. Sintez qilingan 5-xlorizobenzofuran-1,3-dion xromato-mass-spektri tahlil qilinganda uning molekulyar massasiga va parchalanishidan hosil bo‘ladigan ion zarralarining massasiga mos keladigan ionlarni hosil bo‘lishi aniqlandi.

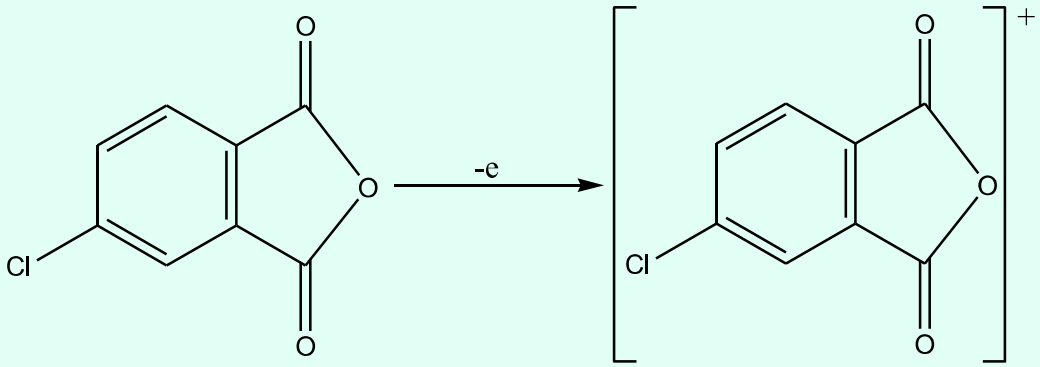


1-rasm. 5-xlorizobenzofuran-1,3-dionning xromato-mass spektri

Bunda 5-xlorizobenzofuran-1,3-dionning molekulyar massasiga mos holda molekulyar ion cho‘qqisi 182 ga teng bo‘ldi. Quyida boshlang‘ich 5-xlorizobenzofuran-1,3-dion molekulyar ionining bosqichli parchalanishidan ionlarning hosil bo‘lish sxemasi keltirilgan.

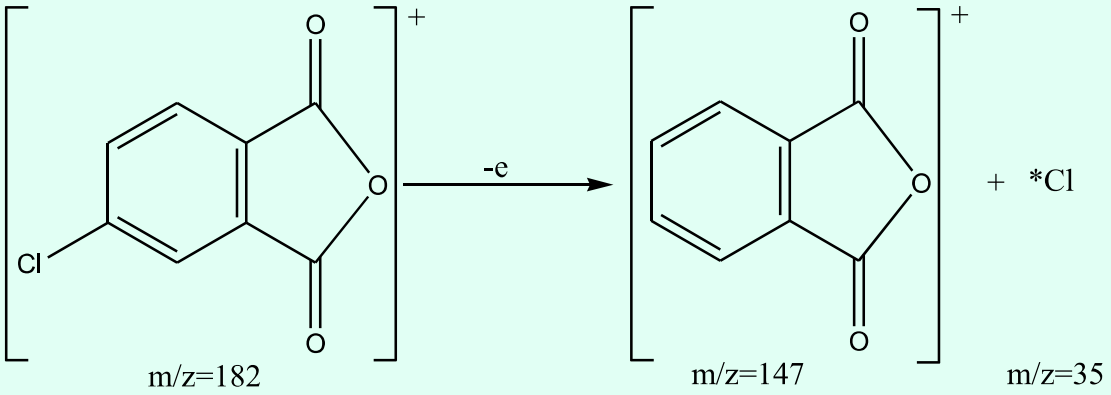
MUHOKAMA VA NATIJALAR

5-xlorizobenzofuran-1,3-dionning xromato-mass spektrometriga kiritilgandan keyin, tanlangan sharoitda 9,179 dan 9,272 minut oralig‘ida m/z 182 bo‘lgan 5-xlorizobenzofuran-1,3-dion molekulyar ioni hosil bo‘ldi.

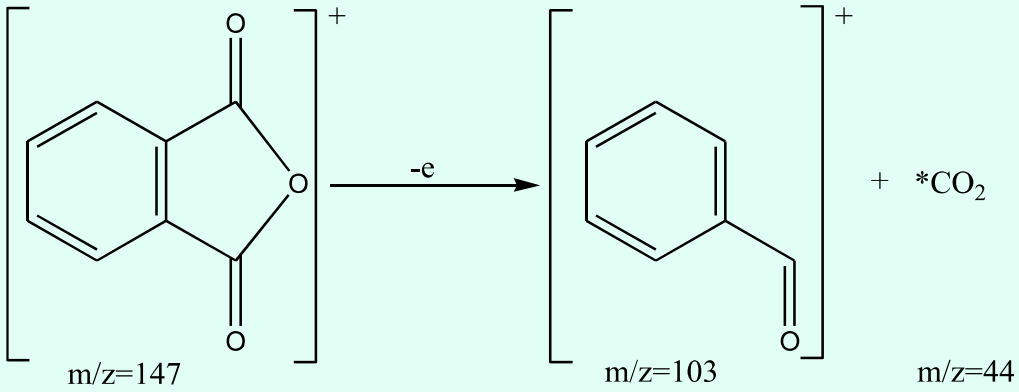


Bundan tashqari spektrda massasi m/z 173, m/z 149, m/z 76, m/z 44, m/z 29, m/z 27 va m/z 24 bo‘lgan ionlarning hosil bo‘lishi aniqlandi. 5-xlorizobenzofuran-1,3-

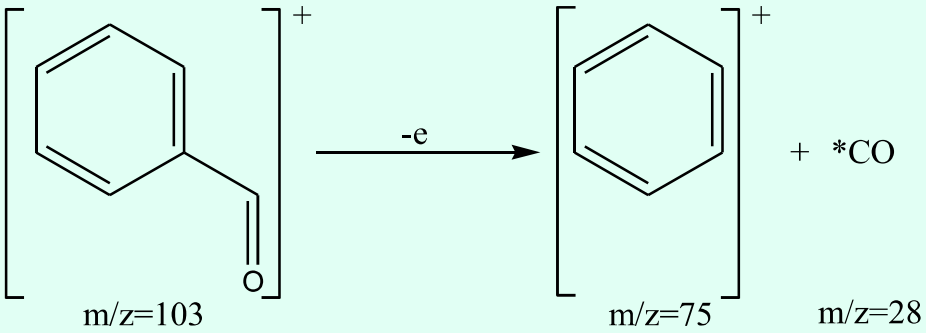
dion ionidan 9,179 minutda –Cl radikalining ajralib chiqishi natijasida m/z 147 ionining ajralishi namoyon bo‘ldi. Bu cho‘qqi m/z 147 bo‘lgan izobenzofuran-1,3-dion ioniga mos keladi va bu bog‘ energiyalariga ham mos keladi.



Izobenzofuran-1,3-dion ionidan 9,179 minutda –CO_2 radikalining ajralib chiqishi natijasida m/z 103 ionining ajralishi namoyon bo‘ldi. Bu cho‘qqi m/z 103 bo‘lgan benzaldegid ioniga mos keladi va bu bog‘ energiyalariga ham mos keladi.



Benzaldegid ionidan –CO radikalining ajralib chiqishi hisobiga m/z 75 ionining ajralishi namoyon bo‘ladi. Bu cho‘qqi m/z 75 bo‘lgan C_6H_3 ioniga mos keladi.



XULOSA

Tahlil oxirida hosil bo‘lgan ionlarning kinetik qonuniyatlari ham o‘z navbatida halqaning ochilish murakkabligiga mos holda sodir bo‘ladi. Dastlabki bosqichda yon zanjirning ionlari ajralishi va so‘nggra halqaning parchalanishi moddaning strukturasini to‘g‘riligi va aniq identifikatsiya qilinganligi, qonuniyatlarga mosligi

bilan izohlanadi. Xromato-mass spektri tahlil natijalari sintez qilingan modda 5-xlorizobenzofuran-1,3-dion ekanligini tasdiqladi.

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