KOSMETIK VOSITALAR TARKIBIDAGI OG‘IR METALLAR MIQDORINI ANIQLASHNING ANALITIK USULLARI

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ANNOTATSIYA

Avvalo, qo‘llaniladigan yondashuvlar og‘ir metallarning umumiy tarkibini skrining va miqdoriy aniqlashga bo‘linadi. Og‘ir metallarni tahlil qilish nafaqat texnik bilim va ko‘nikmalarga ega bo‘lishni, balki ko‘pincha qimmatbaho uskunalarning mavjudligini va namunalarni tayyorlash shartlariga qat’iy rioya qilishni talab qiladi, ayniqsa og‘ir metallar miqdoriy jihatdan aniqlanishi kerak bo‘lsa. Skrining og‘ir metallarning miqdori aniqroq miqdoriy usullarni qo‘llash orqali qo‘shimcha aniqlashni talab qiladimi yoki yo‘qligini aniqlashga yordam beradi. Kosmetik mahsulotlar va kosmetika xom ashyosidagi og‘ir metallarning tarkibini tahlil qilish namunalarni tayyorlash uchun mos usulni va aniqlash usulini tanlashni o‘z ichiga oladi. Analitik sinov shartlari namuna tayyorlash usuli va aniqlash usulining tegishli tekshirish ma’lumotlari bilan zarur kombinatsiyasi bilan belgilanadi.

Kalit so‘zlar: kosmetik vositalar (KV), - rentgen floresansi (RF); - atom yutilish spektrometriyasi (AAS); -induktiv bog‘langan plazma bilan optik emissiya spektroskopiyasi (ISP-OES), induktiv bog‘langan plazma bilan atom emissiya spektroskopiyasi (ISP-AES), induktiv bog‘langan plazma bilan massa spektrometriyasi (ISP - MS).

KIRISH

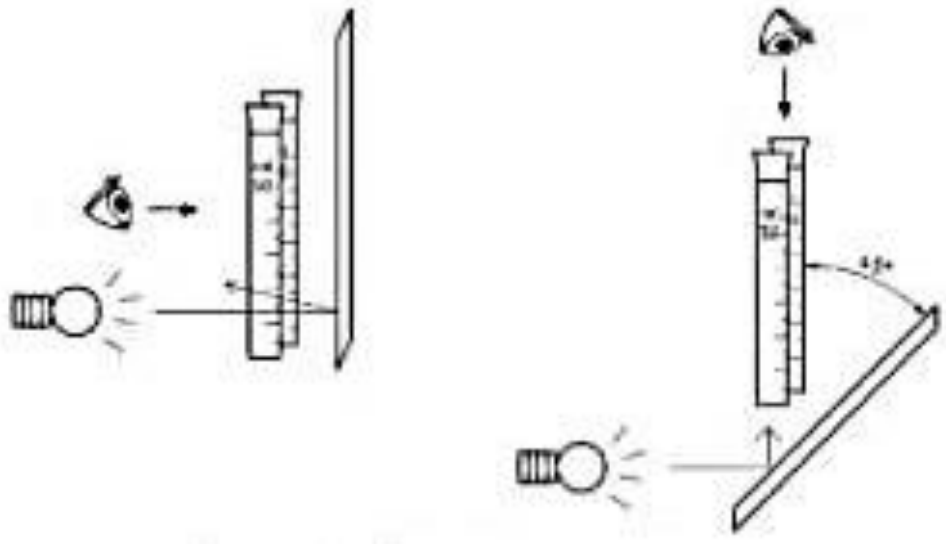
KV tarkibidagi og‘ir metallarni aniqlash usullari, qoida tariqasida, organik va noorganik birikmalar, shuningdek, o‘rganilayotgan elementning birikmalari o‘rtasidagi farqlarni hisobga olmaydi. Masalan, ular metall simob va fenilrtut birikmalarini farqlamaydilar. Bundan tashqari, ular xrom (III) va xrom (VI) kabi elementning mumkin bo‘lgan teng bo‘lmagan valentlik holatlarini e’tiborsiz qoldiradilar. Agar ushbu turdagi ma’lumotlar alohida qiziqish uyg‘otsa, ularni aniqlashtirish uchun tegishli vositalardan foydalanish kerak, masalan, xromatografiya bilan birgalikda ISP-MS (induktiv bog‘langan plazma bilan massa spektrometriyasi) yordamiga murojaat qilish kerak.

Tajriba qism: 1-qism. Kerakli hisoblangan namuna miqdori platina yoki chinni tigelga joylashtirildi, etanolga 20 ml $Mg(NO_3)_2$ $6H_2O$ eritmasi qo‘shildi (1:10) va

yaxshilab aralashtiriladi. Etanolni yoqildi va ozgina issiqlik bilan kuydirildi. Sovutgandan so‘ng, 2 ml H_2SO_4 kislota qo‘shildi, ehtiyotkorlik bilan isitildi va parchalanishdan oldin 500 °C dan 600 °C gacha bo‘lgan haroratda kalsinlandi. Agar ushbu usul yordamida kuygan moddaning bir qismi saqlanib qolsa, qoldiqlar oz miqdordagi H_2SO_4 bilan namlanadi va parchalanmaguncha yana kaltsiylanadi. Sovutgandan so‘ng, qoldiqqa 6 ml HCl qo‘shildi va suv hammomida quritildi. Qoldiqni 6 tomchi HCl bilan namlandi, 20 ml issiq suv qo‘shildi va erimaguncha qizdirildi. Bir tomchi titrlangan fenolftalein eritmasi qo‘shildi, so‘ngra oqargan qizil rang paydo bo‘lguncha titrlangan ammiak eritmasi tomchilab qo‘shildi. 2 ml suyultirilgan CH_3COOH qo‘shildi, (agar kerak bo‘lsa filtrlanadi), 10 ml suv yuvildi va filtrat Nessler naychasiga o‘tkazildi. Suv qo‘shildi, eritma hajmini 50 ml ga keltirildi va hosil bo‘lgan eritmani sinov eritmasi sifatida ishlatildi.

2-qism. Nazorat eritmasini quyidagicha tayyorlandi: etanolda 10 ml $Mg(NO_3)_2$ $6H_2O$ eritmasini olib (1: 10) va etanolni yoqing. Sovutgandan so‘ng, 1 ml H_2SO_4 qo‘shiladi, ehtiyotkorlik bilan isitiladi va 500 °C dan 600 °C gacha bo‘lgan haroratda kalsinlanadi. Sovutgandan so‘ng, 3 ml HCl qo‘shiladi, sinov eritmasini tayyorlash bilan bir xil operatsiyalar bajariladi va 50 ml hajm olinmaguncha standart qo‘rg‘oshin va suv eritmasining kerakli hisoblangan miqdori qo‘shiladi.

3-qism. Sinov eritmasiga va nazorat eritmasiga bir tomchi titrlangan Na_2S eritmasi qo‘shildi, yaxshilab aralashtirildi va 5 daqiqa davomida tindirildi. Na2S eritmasi sinov eritmasiga va nazorat eritmasiga bir vaqtning o‘zida qo‘shilishi juda muhim, chunki bo‘yashning to‘liqligi ta’sir qilish davomiyligiga bog‘liq. Eritmalar oq fonda gorizontal yoki vertikal tekislikda ko‘rib chiqildi va ularning rangi taqqoslandi. Sinov eritmasining rangi nazorat eritmasining rangidan ko‘ra intensiv bo‘lmasligi kerak. Eritmalarning rangini taqqoslashda, noto‘g‘ri xulosani oldini olish uchun yorug‘lik manbasini to‘g‘ri o‘rnatishga alohida e’tibor berilishi kerak. Kuzatish yorug‘likning



yetarli yorqinligi bilan amalga oshiriladi. Bunday holda, mavzu va standart echimlarning yoritilishi bir xil bo‘lishi kerak. Nessler naychasi va qog‘oz yoki karton vazifasini bajaradigan oq fonning optimal nisbiy holati vizual nazorat ostida 1-rasmda ko‘rsatilgan. Kuzatuvdan oldin Nessler naychasidan vilka chiqariladi. Agar eritmalar rangidagi farqni ishonch bilan baholash mumkin bo‘lmasa, mavzu va standart eritmalarning o‘rnini o‘zgartiring va kuzatuvni takrorlang. Ushbu qadam vizual nazorat ostida noto‘g‘ri xulosadan qochishga yordam beradi.

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