Keywords: A mospheric chemis ra: Ear h s a mosphere; Ear h sas em; Phasics; Me eorologa: Ear h sciences; A mospheric chemis ra: UV radia ion; Air poll ion and clima e change; global arming; Labora or a perimen s

Introduction

e Far h s a mosphere is a comple mi re of gases, aerosols, and o her par icles ha in erac i h each o her hro gh physical and chemical processes. e composi ion of he a mosphere aries in space and ime, i h di eren gases and par icles ha ing di eren concen ra ions and dis rib ions [1]. e a mosphere is also in enced by e ernal fac ors s ch as solar radia ion, olcanic ac i i b and h man ac i i ies. e composi ion of he Far h s a mosphere can be di ided in o se eral laters based on al i de and empera re. e lo es later, he roposphere, e ends from he s rface of he Far h o an al i de of abo 10-15 km. e roposphere is here mos of he Far h s ea her occ rs, and i is also he later here mos of he a mospheric chemis ra akes place.

e roposphere is composed primarila of ni rogen (78%), o agen (21%), and argon (0.9%). ese gases are referred o as "permanen gases" beca se hea are rela i ella s able and do no ndergo signi can chemical reac ions [2]. Ho e er, here are also race amo n s of o her gases ha are impor an for a mospheric chemis ra incl ding carbon dio ide (CO2), me hane (CH4), o one (O3), and a er apo r (H2O).

e concen ra ions of hese race gases are s all e pressed in par s per million (ppm) or par s per billion (ppb), hich represen he n mber of molec les of a par ic lar gas per million or billion molec les of air [3]. For e ample, he concen ra ion of CO2 in he a mosphere is c rren la aro nd 415 ppm, hich means ha for e era million molec les of air, abo 415 of hem are CO2 molec les [4]! A mospheric chemis ra in ol es he s da of he so rces, sinks, and ransforma ions of hese race gases and heir e ec s on he Far h s clima e, air q ali a and ecosts ems. For e ample, CO2 is a greenho se gas ha con rib es o global arming be rapping hea in he Far h s a mosphere [5]. Me hane is ano her impor an greenho se gas ha is prod ced be na ral so rces s ch as e lands and rice paddies, as ell as be h man ac i i ies s ch as li es ock farming and fossil f el e rac ion. O one is a molec le ha plates a comple role in a mospheric chemis re In he roposphere, i is a poll an ha can ca se respira ord problems and o her heal h iss es. Ho e er, in he s ra osphere (hich lies abo e he roposphere), o one forms a pro ec i e later ha absorbs harmf 1 l ra iole (UV) radia ion from he s n [6]. is later is kno n as he o one later, and i is impor an for pro ec ing life on Far h from he damaging e ec s of UV radia ion [7].

A mospheric chemis realso in ol es he s de of aerosols, hich are ine par icles ha are s spended in he a mosphere [8]. Aerosols can be na ral (s ch as d s and sea sal) or h man-made (s ch as soo and s lfa e par icles from fossil f el comb s ion). es can ha e bo h posi i e and nega i e e ec s on he Ear h s clima e and air q ali e For

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^{*}Corresponding author: ÖlÉlÜæ { ^ •@ÅS` { ælÅXæl { æÉlÖ^]ælc { ^ }d([-ÅCEc { [•] @^\i&Å Ô@^ { i•cl^ÉlW}içc^!•ic^Å [-Å Õ| [àælÅ Ù&i^ }&^Åæ}åÅc^&@ } [| [* ^Élû } åiæÉl ÒÉ { æil¼ !æ { ^ •@É çæl { O * { æilE& [{ Å

e ample, some aerosols can re ec s nligh back in o space, cooling he Ear h s s rface. Ho e er, o her aerosols can absorb s nligh and con rib e o global arming [9]. e chemis ra of he a mosphere is also in enced ba h man ac i i ies s ch as ind s rial processes, ranspor a ion, and agric l re. ese ac i i ies can release large amo n s of poll an s in o he a mosphere, incl ding ni rogen o ides (NO), s lf r dio ide (SO2), and ola ile organic compo nds (VOCs). ese poll an s can reac i h o her gases in he a mosphere o form secondara poll an s s ch as o one and par ic la e ma er (PM). ese poll an s can ha e signi can impac s on h man heal h, ecosas ems, and clima e [10].

Conclusion

A mospheric chemis rais a comple and in erdisciplinaral eld ha is cri ical o nders anding and mi iga ing he nega i e impac s of air poll ion and clima e change. Ongoing research in his area is essen ial for he de elopmen of e ec i e s ra egies o pro ec he en ironmen, h man heal h, and he plane s f re. A mospheric chemis rais a eld of s da ha foc ses on he chemical composi ion and reac ions ha occ r i hin he Far h s a mosphere. is area of research is cri ical o nders anding ho he a mosphere and he clima e sas em ork, as ell as ho h man ac i i ies are impac ing hese na ral sas ems. In his concl sion, e ill s mmari e some of he kea poin s of a mospheric chemis ra and i s impor ance. One of he mos impor an fac ors in a mospheric chemis rais he role of gases in he a mosphere. ese

a mospheric chemis ratio is he role of gases in he a mosphere. ese gases, 12(din)8(g ni)12(s1 T T8(e s)5()-5(ra)4.1(es)6s in s)5(c)6(htte diale(e, -)-9(oe-6(a)9(r)138pa)9(n)4(d 9(n)4()19())6(e [10].)]Tte diale 1 Tf11C.0022 T te diale 1 Tf11C.0