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(81) 指定国(除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU,

(54) Title: PREPARATION METHOD FOR SEED CRYSTAL LAYER, METAL INTERCONNECTION PROCESS METHOD AND SEMICONDUCTOR PROCESS DEVICE

(54) 发明名称: 籽晶层的制备方法、金属互连工艺方法及半导体工艺设备

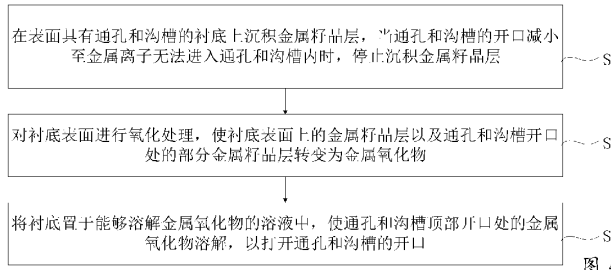


图 4

- S1 Deposit a metal seed crystal layer on a substrate having a surface provided with a through hole and a groove, and when the openings of the through hole and the groove are reduced to a degree that metal ions cannot enter the through hole and the groove, stop depositing the metal seed crystal layer
- S2 Carry out oxidation treatment on the surface of the substrate, so that the metal seed crystal layer on the surface of the substrate and part of the metal seed crystal layer at the openings of the through hole and the groove are converted into metal oxides
- S3 Place the substrate in a solution capable of dissolving the metal oxides, to dissolve the metal oxides at the openings of the through hole and the groove to open the openings of the through hole and the groove

(57) Abstract: The present application discloses a preparation method for a seed crystal layer, a metal interconnection process method and a semiconductor process device. The preparation method for a seed crystal layer comprises: depositing a metal seed crystal layer on a substrate having a surface provided with a through hole or a groove, and when the opening of the through hole or the groove is reduced to a degree that metal ions cannot enter the through hole or the groove, stopping depositing the metal seed crystal layer; carrying out oxidation treatment on the surface of the substrate, so that the metal seed crystal layer on the surface of the substrate and part of the metal seed crystal layer at the opening of the through hole or the groove are converted into metal oxides; and placing the

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CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW。

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substrate in a solution capable of dissolving the metal oxides, to dissolve the metal oxides on the surface of the substrate and at the opening of the through hole or the groove to open the opening of the through hole or the groove. The present application can increase the seed crystal layer coverage rate of the bottom and the side wall of the through hole or the groove, preventing voids from being generated in a subsequent metal electroplating process.

(57) 摘要: 本申请公开了一种籽晶层的制备方法、金属互连工艺方法及半导体工艺设备, 该籽晶层的制备方法包括: 在表面具有通孔或沟槽的衬底上沉积金属籽晶层, 当通孔或沟槽的开口减小至金属离子无法进入通孔或沟槽内时, 停止沉积金属籽晶层; 对衬底表面进行氧化处理, 使衬底表面上的金属籽晶层以及通孔或沟槽开口处的部分金属籽晶层转变为金属氧化物; 将衬底置于能够溶解金属氧化物的溶液中, 使衬底表面以及通孔或沟槽开口处的金属氧化物溶解, 以打开通孔或沟槽的开口。本申请能够实现提高通孔或沟槽底部和侧壁的籽晶层覆盖率, 避免在后续电镀金属过程中产生空洞。