CLAIMS

1. A zeolite membrane composite comprising: a porous support; and a zeolite membrane formed on at least one surface of the porous support, wherein

the zeolite membrane is formed of an X-MOR-type zeolite,

X includes at least one type of transition metal ion, and

the transition metal ion includes at least one among a Ru ion, a Pt ion, and a Mo ion.

2. The zeolite membrane composite according to claim 1, wherein the transition metal ion is a Ru ion.

3. The zeolite membrane composite according to claim 2, wherein the Ru ion is a trivalent Ru ion.

4. A method of separating a branched diolefin comprising a separation step of using the zeolite membrane composite according to any one of claims 1 to 3 to separate a branched diolefin from a branched hydrocarbon mixture containing the branched diolefin and at least one branched hydrocarbon in which the number of carbon-carbon double bonds is 1 or less and that is of an equivalent carbon number n to the branched diolefin.

5. The method of separating a branched diolefin according to claim 4, wherein the carbon number n is 4 or 5.

6. A method of producing a branched diolefin comprising separating the branched diolefin in accordance with the method of separating a branched diolefin according to claim 4 or 5.