Table S1. Raman fitting parameters (peak position, FWHM, I_G/I_D, and I_{2D}/I_G) for carbon-related structures formed on different substrates after growth using vinylsilane as a single-source precursor.
Peak positions, full width at half maximum (FWHM) values, and intensity ratios were obtained by peak fitting of the Raman spectra. For samples exhibiting well-defined graphitic features, D, G, and 2D bands were fitted. For samples in which these bands were not clearly resolved, only the broad carbon-related band centered at approximately 1420–1440 cm^{-1} is reported. The symbol "–" denotes that the corresponding peak was not resolved and was therefore not included in the fitting analysis.

Sample	Broad carbon-related band (cm^{-1})	FWHM (cm^{-1})	D peak position (cm^{-1})	D-band FWHM (cm^{-1})	G peak position (cm^{-1})	G-band FWHM (cm^{-1})	2D peak position (cm^{-1})	2D-band FWHM (cm^{-1})	I_G/I_D	I_{2D}/I_G
SiO_2 750 ℃	1427.1	107.1	–	–	–	–	–	–	–	–
SiO_2 950 ℃	1420.2	114.5	–	–	–	–	–	–	–	–
bulk Ti 750 ℃	1434.2	173.8	–	–	–	–	–	–	–	–
bulk Ti 950 ℃	1436.6	222.2	–	–	–	–	–	–	–	–
bulk Fe 750 ℃	–	–	1348.9	90.0	1582.2	54.1	2692.7	65.9	0.99	0.62
bulk Fe 950 ℃	–	–	1347.2	90.0	1579.2	58.0	2686.4	76.4	0.79	0.41
bulk Ni 750 ℃	–	–	1343.0	140.0	1578.6	78.1	2690.0	57.3	0.67	0.14
bulk Ni 950 ℃	–	–	1344.5	125.0	1580.1	75.2	2685.9	70.6	0.63	0.16
film Co 750 ℃	–	–	1353.4	209.5	1571.8	86.0	–	–	0.33	–
film Co 950 ℃	1421.7	112.1	–	–	–	–	–	–	–	–
film Ti 750 ℃	1415.6	40.8	–	–	–	–	–	–	–	–
film Ti 950 ℃	1426.2	100.0	–	–	–	–	–	–	–	–
film Fe 750 ℃	–	–	1394.4	180.7	1573.0	49.2	2682.0	54.2	0.17	0.079
film Fe 950 ℃	1424.8	109.2	–	–	–	–	–	–	–	–
film Ni 750 ℃	–	–	1343.3	154.1	1574.6	53.6	2675.9	95.9	0.56	0.24
film Ni 950 ℃	1420.4	104.3	–	–	–	–	–	–	–	–

Table S2. XPS peak fitting parameters for Fe bulk and Fe thin-film samples grown at 950 ℃. Binding energies, full width at half maximum (FWHM) values, and relative component areas were obtained from peak fitting of the Si 2p and C 1s spectra. Relative component areas were calculated from fitted peak areas within each core-level spectrum and do not represent elemental atomic concentrations.

Sample	Core level	Component	Binding energy (eV)	FWHM (eV)	Relative component area (%)
Fe bulk	Si 2p	Si–Si	99.24	1.62	5.6
Fe bulk	Si 2p	Si–C	100.56	1.62	38.2
Fe bulk	Si 2p	O–Si–C	101.72	1.62	37.2
Fe bulk	Si 2p	Si–Ox	103.08	1.61	19.0
Fe bulk	C 1s	C–Si	283.24	1.59	9.7
Fe bulk	C 1s	C–C/C–H	284.60	1.60	74.1
Fe bulk	C 1s	C–OH	286.08	1.60	14.7
Fe bulk	C 1s	C=O	288.40	1.60	1.5
Fe thin film	Si 2p	Si–Si	99.22	1.60	1.7
Fe thin film	Si 2p	Si–C	100.70	1.60	82.9
Fe thin film	Si 2p	O–Si–C	102.08	1.60	15.5
Fe thin film	C 1s	C–Si	283.20	1.60	58.9
Fe thin film	C 1s	C–C/C–H	284.50	1.60	39.6
Fe thin film	C 1s	C–OH	286.90	1.60	1.5